

THE PROCESSING OF REFERENTIAL EXPRESSIONS IN DISCOURSE
BY CHINESE, ENGLISH, AND JAPANESE NATIVE SPEAKERS
AND BY CHINESE AND JAPANESE LEARNERS OF ENGLISH

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Mari Miyao

Dissertation Committee:

Bonnie D. Schwartz, Chairperson
Robert Bley-Vroman
Theres Grüter
William O'Grady
Amy Schafer
Shinichiro Fukuda

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ABSTRACT

Referential expressions (REs), such as proper names and pronouns, pose challenges to second language learners (L2ers). Generally, adult native speakers prefer a more explicit RE form (e.g., a proper name) when referring to a less salient/accessible entity in the discourse and a reduced RE form (e.g., a pronoun) for a salient/accessible entity (e.g., Ariel, 1990). To use REs successfully, L2ers need to calculate the accessibility of discourse entities and associate them with particular RE forms. The present study asks how adult L2ers whose first language (L1) is Chinese or Japanese (null-subject languages) comprehend and produce REs in discourses in English (a non-null-subject language).

Experiment 1 looks at the comprehension of REs in subject position (subject-REs), using closely-translated versions of a sentence-by-sentence self-paced reading task adapted from Gordon, Grosz, and Gilliom (1993), by native speakers of English, Chinese, and Japanese. Experiment 2 examines the same participants' production of subject-REs via a three-panel picture-narration task adapted from Arnold and Griffin (2007). Experiments 3 and 4 employ the English version of the two tasks to explore the comprehension and production of subject-REs by intermediate-to-advanced L1-Chinese and L1-Japanese L2ers of English.

In the reading task, native English and native Japanese speakers preferred the most reduced subject-REs in their native language—respectively, overt-pronoun subjects and null-pronoun subjects—for accessible entities; native Japanese speakers strongly dispreferred overt-pronoun subjects. Different reading-time (i.e., raw vs. residual) analyses indicated different subject-RE preferences for native Chinese speakers, but they never dispreferred overt-pronoun subjects. In the production task, all three language groups preferred pronominal subject-REs for accessible entities, but when accessibility was reduced by the presence of another entity in the discourse, by gender congruence, or by a shifted discourse focus, they produced (more explicit) repeated-name subject-REs more frequently.

Neither L2 group showed subject-RE preferences in reading, but in production, where pictures helped build firm discourse representations, they clearly preferred pronominal subjects for accessible entities and repeated-name subjects for less accessible entities. Overall, the present study suggests that when sufficient contextual support is provided, L2ers can calculate discourse accessibility and choose subject-RE forms according to the accessibility level (*contra* Sorace, 2011).

TABLE OF CONTENTS

Acknowledgments.....	iii
Abstract.....	v
List of Tables	x
List of Figures.....	xii
 CHAPTER 1: INTRODUCTION.....	 1
CHAPTER 2: USE OF REFERENTIAL EXPRESSIONS BY NATIVE SPEAKERS.....	5
2.1 Theories on the use of REs	6
2.1.1 Correlation of discourse accessibility and the form of REs.....	6
2.1.2 Discourse processing and the Repeated Name Penalty	16
2.1.3 Summary	22
2.2 Processing of null- and overt-pronoun subjects in null-subject languages.....	24
2.2.1 Processing null vs. overt subject pronouns in Italian and Spanish	26
2.2.2 Processing null vs. overt subject pronouns in Chinese	33
2.2.3 Processing null vs. overt subject pronouns in Japanese.....	38
2.2.4 Summary	44
2.3 RE-form preferences in comprehension vs. production	45
2.4 Research questions and motivation for Experiments 1 and 2	49
CHAPTER 3	
EXPERIMENT 1: ONLINE COMPREHENSION OF REFERENTIAL EXPRESSIONS	
BY NATIVE SPEAKERS	52
3.1 Introduction.....	52
3.2 Experiment 1A: Native English speakers	54
3.2.1 Participants.....	54
3.2.2 Materials	54
3.2.3 Procedure	58
3.2.4 Preparation for data analysis.....	58
3.2.5 Results.....	60
3.3 Experiment 1B: Native Chinese speakers.....	65

3.3.1 Participants.....	66
3.3.2 Materials	66
3.3.3 Procedure	69
3.3.4 Preparation for data analysis.....	69
3.3.5 Results.....	69
3.4 Experiment 1C: Native Japanese speakers	77
3.4.1 Participants.....	77
3.4.2 Materials	77
3.4.3 Procedure	80
3.4.4 Preparation for data analysis.....	80
3.4.5 Results.....	81
3.5 Discussion	87
CHAPTER 4	
EXPERIMENT 2: NATIVE PRODUCTION OF REFERENTIAL EXPRESSIONS	90
4.1 Introduction.....	90
4.2 Experiment 2A: Native English speakers	94
4.2.1 Participants.....	94
4.2.2 Materials	94
4.2.3 Procedure	95
4.2.4 Preparation for data analysis.....	95
4.2.5 Results.....	96
4.3 Experiment 2B: Native Chinese speakers.....	102
4.3.1 Participants.....	102
4.3.2 Materials	102
4.3.3 Procedure	104
4.3.4 Preparation for data analysis.....	104
4.3.5 Results.....	104
4.4 Experiment 2C: Native Japanese speakers	108
4.4.1 Participants.....	108
4.4.2 Materials	108
4.4.3 Procedure	108

4.4.4 Preparation for data analysis.....	108
4.4.5 Results.....	109
4.5 Discussion.....	110
CHAPTER 5	
EXPERIMENT 3: ONLINE COMPREHENSION OF REFERENTIAL EXPRESSIONS BY L2 LEARNERS OF ENGLISH.....	115
5.1 Introduction.....	115
5.1.1 L2ers' comprehension of subject-REs in discourse.....	117
5.1.2 Predictions for Experiment 3	127
5.2 Experiment 3: L1-Chinese and L1-Japanese L2ers of English.....	130
5.2.1 Participants.....	130
5.2.2 Materials and procedure.....	131
5.2.3 Preparation for data analysis.....	131
5.2.4 Results.....	132
5.3 Discussion	143
CHAPTER 6	
EXPERIMENT 4: L2 PRODUCTION OF REFERENTIAL EXPRESSIONS	146
6.1 Introduction.....	146
6.2 Experiment 4: L1-Chinese and L1-Japanese L2ers of English.....	152
6.2.1 Participants.....	152
6.2.2 Materials and procedure.....	152
6.2.3 Preparation for data analysis.....	153
6.2.4 Results.....	153
6.3 Discussion	169
CHAPTER 7: CONCLUSION	174
7.1 Major findings.....	175
7.2 Implications and future directions	178
APPENDIX A: Items for the self-paced reading task (Experiments 1 & 3)	181
APPENDIX B: C-test used for native-English and L2-English participants.....	220
APPENDIX C: Q-Q plots for Experiments 1 and 3	221
APPENDIX D: Plots for checking homoscedasticity	222

APPENDIX E: Fill-in-the-blank task for native Chinese participants	223
APPENDIX F: Fill-in-the-blank task for native Japanese participants	224
APPENDIX G: Items for the picture-narration task (Experiments 2 & 4)	225
REFERENCES	236

LIST OF TABLES

2.1. Pronouns used to refer to <i>in-focus</i> entities in five languages (Gundel et al., 1993)	39
2.2. Test conditions and a sample item in Arnold and Griffin (2007)	46
3.1. Residual RT results for the two-entity context (English natives, with Proficiency)	62
3.2. Residual RT results for the two-entity context (English natives, without Proficiency)	63
3.3. Raw RT results for the two-entity context (English natives, with Proficiency)	64
3.4. Residual RT results for the two-entity context (Chinese natives)	72
3.5. Raw RT results for the two-entity context (Chinese natives)	74
3.6. Residual RT results for the one-entity context (Chinese natives).....	76
3.7. Residual RT results for the two-entity context (Japanese natives)	82
3.8. Raw RT results for the two-entity context (Japanese natives).....	85
3.9. Residual RT results for the one-entity context (Japanese natives)	86
4.1. Statistical results for the comparisons of the One-Entity vs. GMM Continue conditions (English natives)	98
4.2. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (English natives)	99
4.3. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (English natives).....	101
4.4. Mean percentage and SD of subject-REs elicited with the old stimuli (Chinese natives)..	105
4.5. Mean percentage and SD of subject-REs elicited with the new stimuli (Chinese natives)	106
4.6. Mean percentage and SD of subject-REs (Japanese natives)	109
5.1. Results of the C-test for the L2ers and native English speakers.....	131
5.2. Residual RT results for the two-entity context (L1-Chinese L2ers).....	134
5.3. Raw RT results for the two-entity context (L1-Chinese L2ers)	135
5.4. Residual RT results for the two-entity context (L1-Japanese L2ers)	137
5.5. Raw RT results for the two-entity context (L1-Japanese L2ers)	138
5.6. Residual RT results for the one-entity context (L1-Chinese L2ers)	140
5.7. Raw RT results for the one-entity context (L1-Chinese L2ers).....	140
5.8. Residual RT results for the one-entity context (L1-Japanese L2ers).....	142
5.9. Raw RT results for the one-entity context (L1-Japanese L2ers)	142

6.1. A sample item of discourse conditions in Experiment 4	146
6.2. Statistical results for the group comparison of the One-Entity vs. GMM Continue conditions (English natives, L1-Chinese L2ers, & L1-Japanese L2ers)	155
6.3. Statistical results for the comparison of the One-Entity vs. GMM Continue conditions (L1-Chinese L2ers)	156
6.4. Statistical results for the comparisons of the One-Entity vs. GMM Continue conditions (L1-Japanese L2ers)	158
6.5. Statistical results for the group comparison of the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (English natives, L1-Chinese L2ers, & L1-Japanese L2ers)	160
6.6. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (L1-Chinese L2ers)	161
6.7. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (L1-Japanese L2ers)	163
6.8. Statistical results for the group comparison of the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (English natives, L1-Chinese L2ers, & L1-Japanese L2ers)	165
6.9. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (L1-Chinese L2ers)	167
6.10. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (L1-Chinese L2ers)	168

LIST OF FIGURES

2.1. RT Pattern A indicating a division of labor between null and overt pronouns.....	24
2.2. RT Pattern B indicating a division of labor between null and overt pronouns.....	24
2.3. Mean residual RTs in Carminati's (2002) Experiment 1 (GM entities)	27
2.4. Mean residual RTs (GM entities) for the Italian group in Filiaci et al. (2014).....	29
2.5. Mean residual RTs (GM entities) for the Spanish group in Filiaci et al. (2014)	29
2.6. Mean raw RTs in Carminati's (2002) Experiment 8 (GMM entities)	31
2.7. Mean raw RTs in Gelormini-Lezama & Almor's (2011) Experiment 1 (GMM entities)	32
2.8. Approximate mean raw RTs in Yang et al.'s (1999) Experiment 3 (GM entities).....	36
2.9. Approximate mean raw RTs in Yang et al.'s (1999) Experiment 4 (GMM entities)	36
2.10. Approximate mean raw RTs in Yang et al.'s (1999) Experiment 2 (GMM entities)	37
2.11. Approximate mean raw RTs in Shoji et al. (2017) (GMM entities).....	43
3.1. Mean residual log RTs for the Continue condition (English natives)	62
3.2. Mean residual log RTs for the Shift condition (English natives)	62
3.3. Mean log RTs for the Continue condition (English natives)	64
3.4. Mean log RTs for the Shift condition (English natives)	64
3.5. Mean residual log RTs for the one-entity context (English natives)	65
3.6. Mean log RTs for the one-entity context (English natives).....	65
3.7. Mean residual log RTs for the Continue condition (Chinese natives).....	71
3.8. Mean residual log RTs for the Shift condition (Chinese natives).....	71
3.9. Mean log RTs for the Continue condition (Chinese natives)	73
3.10. Mean log RTs for the Shift condition (Chinese natives)	73
3.11. Mean residual log RTs for the one-entity context (Chinese natives).....	75
3.12. Mean log RTs for the one-entity context (Chinese natives)	75
3.13. Mean residual log RTs for the Continue condition (Japanese natives)	82
3.14. Mean residual log RTs for the Shift condition (Japanese natives)	82
3.15. Mean log RTs for the Continue condition (Japanese natives)	84
3.16. Mean log RTs for the Shift condition (Japanese natives)	84
3.17. Mean residual log RTs for the one-entity context (Japanese natives)	86
3.18. Mean log RTs for the one-entity context (Japanese natives).....	86

4.1. Mean proportion of repeated-name subjects in the One-Entity vs. GMM Continue conditions (English natives).....	97
4.2. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (English natives).....	99
4.3. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (English natives).....	100
4.4. Proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions plotted along C-test scores (English natives).....	102
4.5. Mean proportion of subject-REs elicited with the old stimuli (Chinese natives).....	104
4.6. Mean proportion of subject-REs elicited with the new stimuli (Chinese natives).....	105
4.7. Mean proportion of subject-REs (Japanese natives).....	109
5.1. Mean residual log RTs for the Continue condition (L1-Chinese L2ers).....	133
5.2. Mean residual log RTs for the Shift condition (L1-Chinese L2ers).....	133
5.3. Mean log RTs for the Continue condition (L1-Chinese L2ers).....	135
5.4. Mean log RTs for the Shift condition (L1-Chinese L2ers).....	135
5.5. Raw RTs in the two-entity context plotted along C-test scores (L1-Chinese L2ers).....	136
5.6. Mean residual log RTs for the Continue condition (L1-Japanese L2ers).....	137
5.7. Mean residual log RTs for the Shift condition (L1-Japanese L2ers).....	137
5.8. Mean log RTs for the Continue condition (L1-Japanese L2ers).....	138
5.9. Mean log RTs for the Shift condition (L1-Japanese L2ers).....	138
5.10. Raw RTs in the two-entity context plotted along C-test scores (L1-Japanese L2ers).....	139
5.11. Mean residual log RTs for the one-entity context (L1-Chinese L2ers).....	140
5.12. Mean log RTs for the one-entity context (L1-Chinese L2ers).....	140
5.13. Raw RTs in the one-entity context plotted along C-test scores (L1-Chinese L2ers).....	141
5.14. Mean residual log RTs for the one-entity context (L1-Japanese L2ers).....	141
5.15. Mean log RTs for the one-entity context (L1-Japanese L2ers).....	141
5.16. Raw RTs in the one-entity context plotted along C-test scores (L1-Japanese L2ers).....	142
6.1. Mean proportion of repeated-name subjects in the One-Entity vs. GMM Continue conditions (English natives, L1-Chinese L2ers, & L1-Japanese L2ers).....	154
6.2. Mean proportion of repeated-name subjects in the One-Entity vs. GMM Continue conditions (L1-Chinese L2ers).....	156

6.3. Proportion of repeated-name subjects in the One-Entity and GMM Continue conditions plotted along C-test scores (L1-Chinese L2ers).....	157
6.4. Mean proportion of repeated-name subjects in the One-Entity vs. GMM Continue conditions (L1-Japanese L2ers)	157
6.5. Proportion of repeated-name subjects in the One-Entity vs. GMM Continue conditions plotted along C-test scores (L1-Japanese L2ers)	159
6.6. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (English natives, L1-Japanese L2ers, & L1-Japanese L2ers)	159
6.7. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (L1-Chinese L2ers).....	161
6.8. Proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions plotted along C-test scores (L1-Chinese L2ers)	162
6.9. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (L1-Japanese L2ers)	162
6.10. Proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions plotted along C-test scores (L1-Japanese L2ers).....	164
6.11. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (English natives, L1-Chinese L2ers, & L1-Japanese L2ers)	165
6.12. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (L1-Chinese L2ers)	166
6.13. Proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions plotted along C-test scores (L1-Chinese L2ers).....	166
6.14. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (L1-Japanese L2ers)	168
6.15. Proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions plotted along C-test scores (L1-Japanese L2ers).....	169

CHAPTER 1

INTRODUCTION

When we communicate, we refer to things and people. Two college students may talk about a classmate in their linguistics course or the actors in a movie that they saw the other day. The people or protagonists who are mentioned in a discourse, the *discourse entities*, can be referred to with various forms of *referential expressions* (“REs”); the classmate in the linguistics course can be referred to with her full name, with her first name, with a full NP like *the girl who always sits by the window*, with the pronoun *she*, and so forth. Since many forms of REs are available and since other protagonists are co-present in a discourse, the speaker needs to be able to select an RE form that allows the hearer to easily pick out the intended referent for successful communication.

The present study investigates how native speakers and second language learners (“L2ers”) comprehend and produce REs in various discourse contexts. When the speaker tells a story about a girl, this discourse entity must be highly salient in his/her mental representation and in the hearer’s mental representation of the story. The speaker does not need to use the girl’s name every time he/she refers to her; the pronoun *she* should suffice. But when another entity is introduced into the discourse, the speaker needs to decide if he/she wants to keep using a pronoun or switch to another RE form. Previous studies in the field of discourse processing have found that various features of discourse influence our choice/preference of RE forms. The presence of an additional entity in the discourse affects the speaker’s choice of RE form for the target discourse entity (e.g., Arnold & Griffin, 2007), and syntactic structure also plays a role. In comprehension studies, native English speakers, for instance, have been found to prefer a reduced form of REs (e.g., a pronoun vis-à-vis a proper name) in subject position to refer to an entity denoted by the subject of a preceding sentence; the use of an explicit form in this situation causes processing difficulty (the Repeated Name Penalty; Gordon, Grosz, & Gilliom, 1993). Another factor is the gender match/mismatch between entities. When a discourse has a male and a female, a pronoun (in, e.g., English) would suffice to distinguish the entities, but when there are two entities with the same gender in the discourse, a pronoun creates referential ambiguity and so an RE with disambiguating information is preferred (e.g., Arnold, Eisenband, Brown-Schmidt, & Trueswell, 2000). The present study is interested in whether L2ers take these

types of contextual information into consideration when they produce and comprehend REs within discourse.

Some L2 researchers argue that even near-native L2ers are likely to have difficulty coordinating lexical/morpho-syntactic information with discourse/pragmatic information. Sorace and her colleagues (e.g., Sorace & Filiaci, 2006) reported that their near-native English-speaking L2ers of Italian showed native-like interpretation of null subject pronouns, but their interpretation of overt subject pronouns diverged from that of Italian natives. Roberts, Gullberg, and Indefrey (2008) claimed that in comparison to Dutch natives, their advanced-level Turkish-speaking and German-speaking L2ers of Dutch were not effectively guided by the accessibility information of discourse entities during online comprehension of a discourse. Contemori and Dussias (2016), by contrast, showed that like native English speakers, Spanish-speaking L2ers of English chose an appropriate RE form according to the degree of discourse accessibility of entities, although they still seemed to rely on a strategy that reduces processing burden.

The present study investigates the online comprehension and production of REs in discourse by low-intermediate-to-advanced L2ers of English whose first language (“L1”) is Chinese or Japanese, using a self-paced reading task and a picture-narration task. Previous studies that found L2ers’ nonnative-like interpretation of overt subject pronouns (e.g., Belletti, Bennati, & Sorace, 2007; Sorace & Filiaci, 2006) often used complex test sentences and cognitively demanding tasks (e.g., look at three similar pictures at the same time and pick one or more that matches the test sentence). Studies that examined L2ers’ subject pronoun resolution used sentences with referentially ambiguous pronouns, which are inherently hard to process. L2 processing studies in general often compare one group of L2ers with a group of native controls, but it is not clear whether any difference found between the two groups can be attributed to influence from the L1 of the L2ers or to a general characteristic of L2 processing (e.g., nonnative-like behavior due to limited processing capacity). Thus, we will use, first, a comprehension task in which participants read test sentences that do not have a referentially ambiguous subject pronoun and then simply answer comprehension questions, and, second, a production task in which participants look at pictures with well-known Disney characters and describe the action of the entities in simple sentences. The target language of the L2 study is English, and the native language of our L2 participants is either Chinese or Japanese. So in

addition to the English version of the tasks, there are also closely translated Chinese and Japanese versions; this allows a comparison of the general patterns of native speakers across the three languages. We will then compare the performance of the Chinese-speaking and Japanese-speaking L2ers to see if nonnative-like processing behavior, if there is any, can be attributed to differences between Chinese and Japanese.

Now we would like to clarify some terms used in this dissertation. The fundamental assumption in the studies of discourse processing is that REs like a pronoun and a proper name are used to refer to entities in the world like a male named “John” and a female named “Mary” or fictional characters like “Mickey” and “Minnie,” not linguistic elements (*antecedents*) like NPs *Bill* and *Kate* in a preceding/following sentence/clause. Thus, in principle, one can refer to the entity denoted by a subject NP, but one cannot refer to a subject antecedent; an RE and its antecedent corefer to an entity. To avoid confusion, we will use small caps for discourse entities (e.g., JOHN and MARY) and italics for antecedents (e.g., *Bill* and *Kate*). Another pair of terms that need specification is *salience* and *accessibility*, as they will often be used interchangeably but do not have the exact same meaning. We will use the term *salience* for entities in the world; when the discourse focus is placed on an entity, we assume that that entity is relatively more salient than any other discourse entities. Following Ariel (1990), we will use the term *accessibility* to mean the *activation* of a semantic representation in memory. When the hearer/reader encounters the RE *John* in a sentence, he/she adds the semantic representation of JOHN to the discourse representation in his/her mind. When the speaker/writer places the discourse focus on JOHN, JOHN becomes salient and the representation becomes highly activated. When the hearer/reader again encounters an RE for JOHN in a subsequent sentence, he/she can easily identify and retrieve the representation of JOHN from memory and thus it is said to be accessible.

The rest of this dissertation is organized as follows. Chapter 2 reviews major theories on the use of REs as well as psycholinguistic studies that investigated the comprehension and production of REs in discourse by native speakers of English and null-subject languages. Chapter 3 reports the results from Experiment 1, which examined the online comprehension of REs by native speakers of English, Chinese, and Japanese. Chapter 4 reports the results from Experiment 2, a picture-narration experiment, in which the three groups of native speakers looked at pictures and narrated the story depicted there. Chapters 5 and 6 discuss Experiments 3 and 4, which tested, respectively, the comprehension and the production of REs by L2ers of

English using the same materials and tasks from Experiments 1 and 2. Lastly, Chapter 7 concludes the dissertation.

CHAPTER 2

USE OF REFERENTIAL EXPRESSIONS BY NATIVE SPEAKERS

One interesting fact about language is that multiple forms of referential expressions (REs) are available to refer to the same discourse entity and the same RE form can be used to refer to multiple discourse entities. Because of the lack of a straightforward form-entity connection, the speaker¹ needs to decide which form of RE to use for every reference to an entity. How does he/she pick one from many options, and what factors guide the decision process? This has long been a question in linguistics and psychology. Previous studies on REs in discourse generally agree on two assumptions. One is that some discourse entities are more salient than others and receive more attention from the speaker and the hearer. The mental representations of salient entities can be accessed and retrieved quickly. The second assumption is that the accessibility of (the representations of) entities influences the choice of RE form in one way or another. Thus, theories of RE use differ from each other not in terms of whether there is a relationship between discourse accessibility and RE form, but rather in terms of what factors influence discourse accessibility and how it is coded with REs.

The first part of this chapter reviews studies that conducted extensive analyses of text and found a correlation between the accessibility of discourse entities and the forms of REs used to refer to those entities. It also reviews a few accounts of how different RE forms appearing in the subject position of a sentence (henceforth *subject-REs*) influence our online comprehension of discourse. The second section compares studies that examined native Italian, Spanish, Chinese, and Japanese speakers' online comprehension of null and overt subject pronouns in discourse. Section 3 briefly looks at a study that reported that English speakers' choice of RE forms in production seems slightly different from their preference of RE forms in comprehension. The last section summarizes the main findings of the literature review and states predictions for Experiments 1 and 2 of the present study.

¹ Throughout this dissertation, the term *speaker* is used as a shorthand for both speaker and writer, and the term *hearer* as a shorthand for both hearer and reader.

2.1 Theories on the use of REs

2.1.1 Correlation of discourse accessibility and the form of REs

Topic Continuity

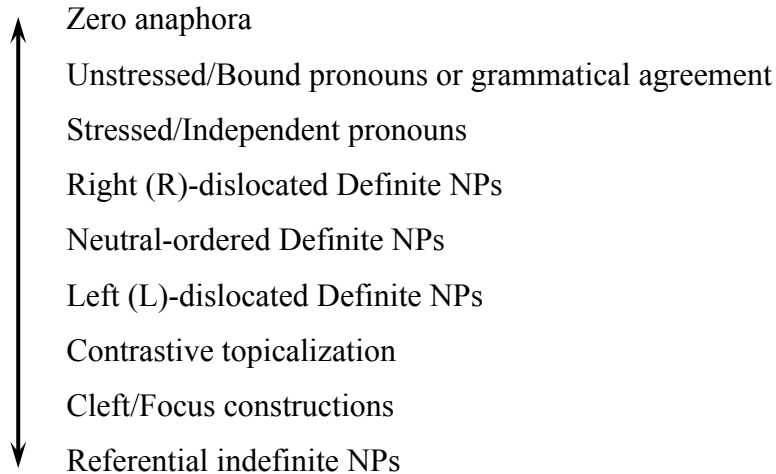
A line of research in the late 1970s and the 1980s examined the relationship between the form of REs and the degree to which their referents are continuously referred to in the discourse. Givón (1983) assumes that discourse topics/entities that are closely related to the theme of a (oral/written) paragraph are more continuously referred to over several clauses and thus remain more salient/accessible than entities that play peripheral roles in the paragraph. It was predicted that when the speaker refers to discourse entities, he/she makes assumptions about the accessibility of those entities in the hearer's mind and codes them using various grammatical devices (i.e., RE forms) so that the hearer can easily identify the intended referents.

To test the prediction, Givón and his colleagues extracted (third-person) REs from various texts and assessed how continuously their referents were referred to. They used three measurements: (i) the number of clauses between an RE and the most recent antecedent in the previous discourse (*referential distance*); (ii) the occurrence of references to entities other than the target entity (henceforth *competitors*) within the last one to five clauses (*potential interference*); and (iii) the number of clauses to the right in which the target entity continues to be referred to (*persistence*). Shorter referential distance, lack of potential interference, and longer persistence were predicted to make an entity more continuous/accessible. The scale in (1) shows the correlation between topic continuity/accessibility and RE forms most commonly found in languages.²

² Most studies do not use the term *referential expressions* for syntactic constructions (e.g., right/left dislocation). Givón (1983) calls the elements in (1) *grammatical devices*, but here we use *REs* for convenience and consistency.

(1) Givón's Topic Continuity/Accessibility Scale³

Most continuous/accessible topic



Most discontinuous/inaccessible topic

(adapted from Givón, 1983, p. 17, [10])

The scale indicates that the speaker codes the most accessible discourse entities with zero anaphora (e.g., null pronouns) and the least accessible discourse entities with referential indefinite NPs. Givón explains some principles underlying this scale. One is a motor-behavior principle, “[e]xpend only as much energy on a task as is required for its performance” (p. 18), which is similar to Grice’s (1975) Maxim of Quantity. If the speaker’s priority in communication is to be maximally clear and unambiguous, then he/she would use the most explicit RE form all the time, and scales like (1) would not be necessary. In reality, however, the speaker tries to provide only necessary and sufficient information, according to Givón. This is why various RE forms are needed to code various degrees of accessibility.

Another principle is related to the correlation between continuity and the lexical content of RE forms: “The more disruptive, surprising, discontinuous or hard to process a topic is, the more *coding material* must be assigned to it” (Givón, 1983, p. 18). This can be clearly seen in the sub-scale for *phonological size* (zero anaphora > unstressed/bound pronouns [‘agreement’] > stressed/independent pronouns > full NPs) and in the sub-scale for *stress* (unstressed pronouns > stressed pronouns; non-cleft/focus constructions > cleft/focus constructions; non-contrastively topicalized NPs > contrastively topicalized NPs).

³ This is our label, since Givón does not name his scale.

The last principle is to “[a]ttend first to the most urgent task” (p. 20), which is relevant to the sub-scale of *word order* (R-dislocation > neutral word order > L-dislocation). This means that when an entity MARY is highly accessible or familiar to the hearer, the speaker can use R-dislocation and place the RE *Mary* at the end of a sentence (e.g., *I saw her yesterday, Mary*) because the most urgent task is to express the seeing event, rather than to tell who was seen yesterday. But when the most urgent task is to tell whom the speaker saw, then he/she can use L-dislocation by placing *Mary* at the beginning (e.g., *Mary, I saw her yesterday*).

Givón stresses that the correlation between discourse accessibility and RE forms should be a universal phenomenon. Different languages will have different numbers of *coding points* (the degrees of accessibility that RE forms code) along the Topic Continuity/Accessibility Scale; and within a language, a certain range on the scale will have more coding points than another range does (*over-coding* vs. *under-coding*). Nevertheless, the relative order of RE forms should be maintained across languages, meaning that there should not be a language that codes an entity with a stressed pronoun and a less accessible entity with an unstressed pronoun or a zero anaphor.

A piece of supporting evidence for the topic-continuity account can be found in Clancy (1980). She collected spontaneous production data from 20 native speakers of English (a non-null-subject language) and 20 native speakers of Japanese (a null-subject language) as they told the story of the film *The Pear Stories* (Chafe, 1980) to an interviewer. She reported that 84% of the (overt) subject pronouns in the English data and 86% of the null subject pronouns in the Japanese data were used within two or fewer clauses of their antecedents. She also found that in both languages, 97% of those reduced RE forms were produced when no more than one reference to a competitor intervened between the REs and their antecedents; the use of full NPs increased as the number of intervening references to competitors increased.

However, there were also some cases that the topic-continuity account cannot explain. One is the repetition of full NPs in a short distance, without interference of a competitor. In the Japanese data, for instance, Clancy reported that of the REs that were produced without interference by references to a competitor, 20% were full NPs. She says that the Japanese participants repeated full NPs because, e.g., they wanted to fully establish the referents in the hearer’s discourse representations before starting to use null pronouns (Hinds, 1987). The repeated full NPs also marked subtle discourse transition from *introduction* (e.g., the arrival of a protagonist at the scene) to *action* (e.g., the beginning of a series of his actions). Obana (2003)

adds *time shift* (e.g., a shift from a protagonist's action at a point in time to another action at a later point) and *semantic discontinuity* (e.g., a shift from the description of a protagonist's emotion to the description of his/her action) as reasons for repeated full NPs in short distance.

Another type of problem is the use of a pronoun after several clauses away from its antecedent. An example can be seen in line 24 of the conversation transcript in (2).

- (2)
1. A. Oh my mother wannduh know how's yer grandmother.
 2. B. ·hhh Uh::, (0.3) I don't know I guess she's aw-she's
 3. awright she went to the uh:: hhospital again tihda:y,
 4. A. Mm-hm?
 5. B. ·hh ·t! ·hh A:n:: I guess t'day wz d'day she's
 6. supposetuh find out if she goes in ner not.=
 7. A. =Oh. Oh::.
 8. B. Becuz they're gonna do the operation on the teeuh duct.
 9. -f//fi:rs]t. Before they c'n do t//he cataracts.
 10. A. Mm-hm.
 11. A. Right.
 12. A. Yeah.
 13. B. ·hhh So I don't know I haven:'t yihknow, she wasn' home
 14. by the t-yihknow when I lef'fer school tihday.=
 15. A. =Mm hm.
 16. B. Tch! ·hh So uh I don't kno:w.
 17. (0.3)
 18. B. En: =
 19. A. = °M//hm
 20. B. Well my ant went with her anway this time,
 21. A. Mm hm,
 22. B. My mother didn't go.
 23. A. Mm hm,
 - 24. B. t! ·hhh But uh? I don't know=She probably haf to go
 25. in soo:n though.

(Fox, 1987, pp. 30–31)

In line 1, Speaker A introduces the discourse topic (i.e., Speaker B's grandmother) with a full NP. After several turns, Speaker B uses the pronoun *she* in line 24. From the context, it is clear that the pronoun does not refer to SPEAKER B'S MOTHER denoted by the linearly closest NP *my mother* in line 22 or SPEAKER B'S AUNT denoted by the NP *my a(u)nt* in line 20. According to Fox, the actual referent is not Speaker B's grandmother denoted by *her* in line 20, either. The topic concerning Speaker B's aunt and grandmother ends in line 23; in line 24, Speaker B goes back to the topic of her grandmother's hospitalization in lines 2 to 6. The referent of the *shes* in that part of the conversation is GRANDMOTHER. A speaker can therefore connect a current utterance with a proposition other than the immediately preceding one. Such long-distance pronominalization is called the *return pop*.

Givón (1983) will have difficulty explaining the occurrence of *she* in line 24 because there is a large gap between the RE and its antecedent and because there are a few intervening references to the competitors (i.e., SPEAKER B'S MOTHER and AUNT). To account for the occurrence of the return pop, Fox (1987) looked at the hierarchical structure of the discourse and proposed the following functions for pronouns and full NPs:

- (3) a. The first mention of a referent in a sequence is done with a full NP.
- b. After the first mention of a referent, a pronoun is used to display an understanding of the sequence as not yet closed.
- c. A full NP is used to display an understanding of the preceding sequence containing other mentions of the same referent as closed.

(Fox, 1987, pp. 18–19)

According to (3b), a pronoun signals the continuation of a discourse sequence, but the continuation is not limited to linearly adjacent clauses. Fox says that the *she* in line 24 can be interpreted as signaling the hearer to “return to an ongoing concern after some stretch of talk in which the discussion is about something else” (p. 30). Thus, a pronoun can be used to signal topic continuation between two discourse segments that are linearly distant but hierarchically close.

Accessibility Theory

Ariel (1990) also found a counterexample to the topic-continuity account in her analysis of texts in English. She extracted pronouns (coding high accessibility), demonstratives (coding intermediate accessibility), and definite descriptions (coding low accessibility) from the texts and looked at the positions of their most recent antecedents: in the same sentence, in the previous sentence, in the same paragraph (farther than the previous sentence), or in the previous paragraph. As predicted, the antecedents of pronouns ($n = 529$) were mostly in the same or previous sentence (81%), the antecedents of demonstratives ($n = 84$) were mostly in the previous sentence or in the same paragraph (80%), and the antecedents of definite descriptions ($n = 142$) were mostly in the same or previous paragraph (83%). However, it was still the case that a number of pronouns had an antecedent in relatively distant positions from them ($n = 75$ in “the same paragraph”; $n = 24$ in “the previous paragraph”). A distance-based account would not predict such results.

The problematic cases motivated Ariel (1990) to propose Accessibility Theory. The basic idea is the same as Givón’s (1983), which is that all RE forms in all languages are correlated with the degree of the discourse accessibility of their referents in a principled manner. The speaker uses a particular RE form to indicate to the hearer how easy/automatic it is to retrieve the semantic representation of the referent from memory. The main difference from Givón’s proposal is that Ariel added two more determinants of accessibility. One is *saliency*, which mainly concerns whether the entity is a discourse topic or not. She hypothesized that a discourse topic is highly salient in the hearer’s representations, and so the speaker can use a pronoun to refer to it even several clauses away from the antecedent. In other words, pronouns whose antecedents are even in relatively distant positions should be referring to *discourse topics*. The text data in Ariel (1990) (discussed above) indeed support this hypothesis. When the REs used to refer to discourse topics (rather than peripheral entities) were removed from the data, the number of pronouns’ antecedents in distant positions decreased from 99 to 36 ($n = 34$ in the same paragraph; $n = 2$ in the previous paragraph).

Ariel also uses saliency to explain the asymmetrical preferences between the RE forms used when the antecedent is the subject NP vs. object NP of a preceding sentence. Ariel (1990, 2001) pointed out that when there are two gender-matching entities in the discourse (e.g., *Mary hugged Emily*), the entity denoted by the subject (e.g., MARY) is more likely than the entity

denoted by the object (e.g., EMILY) to be referred to with a reduced RE form in the following clause/sentence, even though this RE is linearly more distant from the subject antecedent than from the object antecedent (e.g., Broadbent, 1973; Purkiss, 1978, mentioned in Sanford & Garrod, 1981). Givón's (1983) text-analysis method cannot capture this fact because his measurement unit for referential distance is clauses. In the sentence *Mary_i kissed Emily_j, and she_i/Emily_j ...*, both subject-REs after *and* would receive the distance score of 1 (i.e., the REs appear one clause after their antecedent).

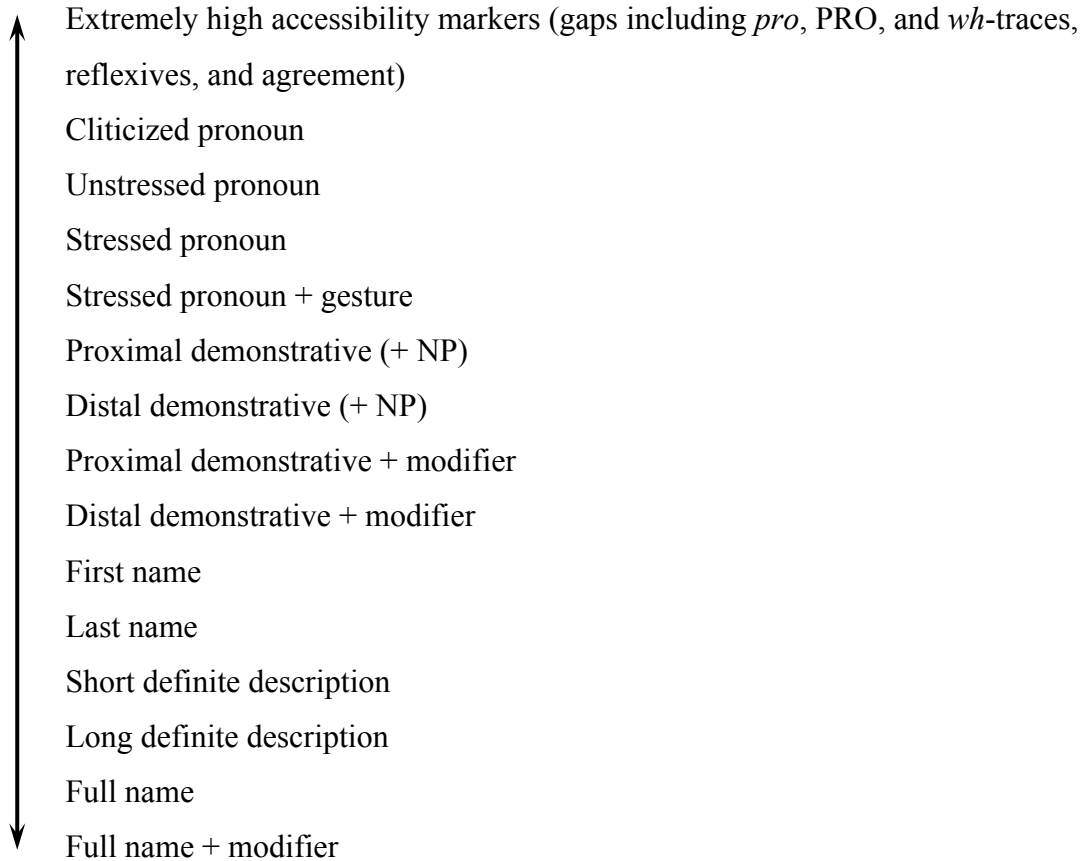
Another factor is *unity*. As mentioned above, change of scenes (Clancy, 1980) and time shift (Obana, 2003) in discourse give the speaker and the hearer a sense of semantic discontinuity. These discourse boundaries push the speaker to use a more explicit RE form unless the referent is a discourse topic.

Ariel (1990) arranged pronouns, demonstratives, and full NPs along the Accessibility Marking Scale in (4).⁴ The correlation between accessibility and RE form in the scale is characterized by three criteria. The most important one is *informativity*. REs placed lower in the scale have more information about their referents, so they can serve as a good "search-guide" for entities with low accessibility. Another criterion is *rigidity*: "how close [the RE] is to pointing to one entity unequivocally in a potentially ambiguous context" (Ariel, 1990, p. 81). Ariel says that this is responsible for the order of RE forms like first, last, and full names; at least in (most) western societies, last names are less ambiguous than first names, and full names are less ambiguous than either first names or last names. The last criterion is *attenuation*, which is similar to Givón's (1983) *phonological size*.

⁴ The scale in Ariel (1990) has low accessibility markers at the top and high accessibility markers at the bottom. The scale was flipped in (4) to match the direction of Givón's scale in (1).

(4) Accessibility Marking Scale

High accessibility



Low accessibility

(adapted from Ariel, 1990, p. 73, [1])

Givenness Hierarchy

Gundel, Hedberg, and Zacharski (1993) provided an account that correlates RE forms (pronouns and determiners only) with *cognitive statuses*, i.e., “information about the location in memory and attention state” (p. 274). The Givenness Hierarchy in (5) shows six cognitive statuses at the top and the RE forms associated with those statuses on the bottom.

(5) The Givenness Hierarchy

in focus > activated > familiar > uniquely identifiable > referential > type-identifiable

<i>it</i>	<i>that</i>	<i>that</i> N	<i>the</i> N	indefinite <i>this</i> N	<i>a</i> N
	<i>this</i>				
	<i>this</i> N				

(Gundel et al., 1993, p. 275, [1])

A pronoun can be used to refer to an entity *in focus*, the representation of which is in the speaker's/hearer's short-term memory and at the current center of attention. According to Gundel, Hedberg, Zacharski et al. (2006), entities such as those denoted by the subject NP of a main clause and a topicalized NP have this status. An NP with the indefinite article is used when the hearer can identify only the type of the intended referent, such as a DOG or a CAR, in his/her discourse representations.

The correlation between cognitive status and RE form is somewhat analogous to the correlation between discourse accessibility and RE form in Givón (1983) and Ariel (1990), but Gundel et al. (1993, 2012) stress that the hierarchy in (5) is an implicational scale and each status entails all the lower statuses. For instance, when the speaker uses *that* N to refer to an entity, he/she indicates that the entity satisfies the necessary and sufficient cognitive conditions for the *familiar* status ("the representation is in memory," Gundel et al., 2012, p. 251) as well as those of the *uniquely identifiable*, *referential*, and *type-identifiable* statuses; however, the entity does not satisfy the conditions for the higher cognitive statuses, *activated* and *in focus*. Since the entity satisfies the conditions of all lower statuses, the speaker could use the RE forms associated with the lower statuses, but Grice's (1975) Maxim of Quantity pushes him/her to use the form associated with the highest possible cognitive status.

The implicational properties of the hierarchy were attested in Gundel et al.'s (1993) analysis of spoken and written data. The authors developed a coding protocol, on the basis of which they determined the cognitive status of the referent of each RE. They reported that in the English texts they analyzed, the majority of the REs used for *in-focus* entities were unstressed pronouns, but occasionally *that*, *the* + N, and *this* + N (the forms for the *activated*, *uniquely identifiable*, and *referential* statuses) were also used. For *activated* entities, unstressed pronouns

were almost never used (only one token found); instead, 29%, 7%, and 63% of the REs used for *activated* entities were the forms associated with, respectively, the *activated* status (*that*, *this*, *this* + N), the *familiar* status (*that* + N), and the *uniquely identifiable* status (*the* + N). Entities in the statuses lower than *activated* were never coded with the forms associated with the *activated* status. The authors extended their investigation to data in Chinese, Japanese, Russian, and Spanish. These languages differ from English and each other with respect to both the types of RE forms they have and the distribution of the forms across the cognitive statuses, but strong correlations between cognitive statuses and RE forms were still found in each language.

In sum, the three traditional accounts of RE use have found a correlation between degree of accessibility of referents or cognitive status of referents, on the one hand, and the form of REs, on the other: The more accessible an entity is in discourse, the less explicit the RE form the speaker uses to refer to that entity. As a discourse unfolds, more and more entities are introduced and their semantic representations are stored together in the discourse representation in the hearer's mind. Every time the hearer encounters an RE in the input, he/she needs to go back to his/her mental representations and reactivate the relevant part so that he/she can update it with the incoming information. During this process, the hearer does not need much help from the RE if the target representation is already highly activated, but he/she does need to depend on the information from the RE if the target representation is inactive or if distinguishing it from the representations of other entities is hard. This is why the speaker, in a cooperative fashion, uses various forms of REs to code the various degrees of accessibility of the entities so as to facilitate the hearer's referent identification/reactivation process. Furthermore, these three theories claim that although each language uses different types of REs, the inverse relationship between the accessibility of entities and the explicitness of RE form should be maintained in all languages.

Note that these accounts assume that the speaker considers the discourse accessibility of entities in the hearer's representations when choosing RE forms; the speaker and the hearer each build a discourse representation using the information that they share (*common ground*), and the speaker keeps track of the accessibility of entities in this representation. However, the speaker may know more about the discourse or may experience more processing burden than the hearer, and as a result, he/she may produce REs that are not optimal for the hearer's referent identification (e.g., Arnold & Griffin, 2007; Fukumura & van Gompel, 2012). If so, the latter

suggests that the speaker may in fact use the accessibility information in his/her own representations as the guide for RE choices. Section 2.3 will come back to this issue.

2.1.2 Discourse processing and the Repeated Name Penalty

This section will look at the use of REs from a language-processing perspective. Centering Theory (Grosz, Joshi, & Weinstein, 1983, 1995) takes a computational-linguistic approach to REs and explores how the form of REs influences our perception of discourse coherence in a local context (i.e., adjacent utterances/sentences within a discourse segment).⁵ It does not suggest a scale or hierarchy that correlates discourse accessibility with RE forms; it instead considers how the speaker's/hearer's focus of attention shifts from one entity to another as well as how the focused entity is expressed linguistically with an RE. The underlying assumption is that the speaker uses an appropriate RE form to minimize the amount of inference in order for the hearer to integrate the meaning of a new sentence into the meaning of the existing discourse.

The three-sentence passages in (6) and (7) illustrate a difference in the degree of coherence. The first two sentences are identical in the two passages, but in the third sentence, the pronominal subject denotes JEFF in (6) and DICK in (7).

- (6) a. Jeff helped Dick wash the car.
b. He washed the windows as Dick waxed the car.
c. He soaped a pane.

(Walker, Joshi, & Prince, 1998, pp. 6–7, [1])

- (7) a. Jeff helped Dick wash the car.
b. He washed the windows as Dick waxed the car.
c. He buffed the hood.

(Walker et al., 1998, p. 7, [2])

⁵ Centering Theory uses the term *utterance*, not *sentence*, when explaining discourse centers and coherence (see below). However, the types of discourse discussed in this dissertation include written text where the term *utterance* seems inappropriate. For oral texts, the two terms are essentially equivalent and so they will be used interchangeably; for written text, we will use the term *sentence*.

The passage (6) is generally perceived as more coherent than the passage (7). In (6), the entity JEFF is always the focused entity because it is continuously referred to with subject-REs, but in (7), the hearer has to infer that the discourse focus has been shifted from JEFF in (7b) to DICK in (7c). This shift of focus makes the passage less coherent.

Centering Theory assumes that a sentence (S_n)⁶ has a set of *forward-looking centers* (Cfs)—the discourse entities evoked in S_n . In (6) and (7), the first sentence has three Cfs: JEFF, DICK, and CAR. They are ranked in the order of prominence; in English, grammatical role (subject > object(s) > other) is the major determinant of the Cf order (Brennan, Friedman, & Pollard, 1987). The highest-ranked Cf is called the *preferred center* (Cp), and it is likely to be referred to again in the following sentence (S_{n+1}). If it is referred to, it serves as a *backward-looking center* (Cb)—an entity that creates a link between S_{n+1} and the preceding sentence S_n . Note that as the secondary discourse entity DICK in (7b) became the discourse center in the next sentence (7c), a low-ranked Cf in S_n can be promoted to the Cb in S_{n+1} , though this shift is not preferred.

Rule 1 of Centering Theory (the *Pronoun Rule*) states that a Cb must be referred to with a pronoun if another Cf is also referred to with a pronoun. This is intuitively so because pronouns are used to refer to an entity already established in the discourse and so they are inherently a linguistic mechanism that establishes coherence (Gordon et al., 1993). The other rule, Rule 2, ranks Cb transitions in the order of preference. Two of the four transitions relevant to the present study—*Continue* and *Smooth-Shift* (or simply *Shift*)—can be seen in, respectively, (6) and (7) above. Rule 2 ranks Continue higher than Shift in the hierarchy of preference.⁷

Gordon et al. (1993) conducted a series of psycholinguistic experiments to examine the claims and predictions of Centering Theory. In their Experiment 4, they used a sentence-by-sentence self-paced reading task to see how Cb transition and subject-RE form influence online comprehension of discourse. Native English speakers were asked to read four-sentence passages like (8a-b-c-d) and (8a-b-c'-d) on a computer screen one sentence at a time, at their own pace (note that four experimental conditions are included in [8]).

⁶ See fn. 5.

⁷ Rule 2 simply states the preference of transition relations, but what it implies is that a preferred transition creates more coherence between two sentences.

- (8) a. George jumped out from behind a tree and frightened Debbie.
 b. He was surprised at her hysterical reaction.

Continue c. **He/George** never thinks about how others might feel.

Shift c'. **She/Debbie** screamed loudly and ran away.

- d. Practical jokes are not always fun for everyone.

(Gordon et al., 1993, pp. 333–334, [1]–[4'])

The passage (8a-b-c-d) is the *Continue condition*, in which the Cb GEORGE in (8b) continues to be the Cb in (8c). The other passage (8a-b-c'-d) is the *Shift condition*, in which the Cb shifts from GEORGE in (8b) to DEBBIE in (8c'). Each of these Transition conditions has two Subject-RE conditions in the third sentence (the *critical sentence*), one with a pronoun and the other with a proper name; since the proper names in the critical sentences are repetitions of the names in (8a), they will be called *repeated names*—and hence these two conditions are, respectively, the *Pronoun condition* and the *Repeated-Name condition*.

The transitions and the subject-RE forms were manipulated to test two predictions. One is that in light of the Pronoun Rule, processing difficulty should occur when a Cb is referred to with a repeated name. The difficulty was expected to appear in the form of a longer reading time (RT) of the critical sentence (8c)/(8c') in the Repeated-Name condition than in the Pronoun condition. The other prediction, built on the first prediction, is that the RT increase caused by a repeated-name subject will be larger in the Continue condition than in the Shift condition because a continued Cb is assumed to be more accessible than a shifted Cb.

The RT results from the experiment supported the predictions: In the Continue condition, the critical sentences with a repeated-name subject elicited a significantly longer RT than those with a pronominal subject (a 183-ms difference), whereas in the Shift condition, RTs were only numerically longer in the Repeated-Name condition (a 42-ms difference). Gordon et al. named the significant RT difference the *Repeated Name Penalty* (RNP). The occurrence of the RNP in the Continue condition and the lack of the RNP in the Shift condition together suggest that a pronoun is preferred over a repeated name when referring to a highly salient discourse entity.

One may wonder if the 183-ms difference in the Continue condition partly came from the difference in sentence length. Generally, (repeated) names contain more letters than pronouns do (e.g., six letters in *George* vs. two in *he*), so the extra letters in a repeated-name subject should

have increased the RT. Gordon et al. did not use residual RTs (i.e., RTs after excluding the effect of length difference) for Experiment 4, but they did analyze residual RTs in their Experiment 1. They used passages starting with sentences like *Bruno was the bully of the neighborhood. Bruno/He chased Tommy all the way home from school one day.* The residual RTs in the first and second sentences were compared in each RE condition. They found that in the Pronoun condition, the second sentence was read significantly faster than the first sentence, whereas in the Repeated-Name condition, the second sentence was read at about the same speed as the first sentence. This indicates that there was a penalty in the Repeated-Name condition even after sentence length was factored out (see also, e.g., Hudson-D’Zmura & Tanenhaus, 1998). In addition, if the length of REs had been the only factor that affected RTs, then a significant RT difference should have been observed in both the Continue and Shift conditions.

Many studies have found a preference for a pronominal subject in a subsequent sentence/clause for an entity denoted by the subject NP of a preceding sentence/clause (e.g., Crawley & Stevenson, 1990; Crawley, Stevenson, & Kleinmann, 1990) or by the first NP of a preceding sentence/clause (e.g., Gernsbacher & Hargreaves, 1988).⁸

Discourse Prominence Theory

Gordon et al. claim, adopting Centering Theory, that the RNP occurs because the use of a repeated name for a continued Cb violates the Pronoun Rule. But “a violation of a rule” does not in and of itself explain any psychological mechanism underlying the processing difficulty, so one may wonder if and how processing strategies can account for the occurrence of the RNP. Here, we will look at two theories that are often discussed in relation to this issue.

Discourse Prominence Theory (DPT; Gordon & Hendrick, 1998) claims that the RNP occurs because the language processor needs to go through more steps when comprehending a repeated name than when comprehending a pronoun. The DPT, developed based on Kamp and Reyle’s (1993) Discourse Representation Theory, assumes that pronouns and proper names are different not only in form but also in fundamental functions: Pronouns (i.e., third-person pronouns) refer to entities that have already been introduced into the discourse, whereas,

⁸ The present study is interested in the processing of subject-REs. For the processing of object-REs, readers are directed to studies such as Chambers and Smyth (1998), who found English counterevidence to another prediction of Centering Theory, namely, that the preferred antecedent of an object pronoun is the object NP of the preceding sentence when the two sentences have parallel syntactic structure.

according to the *Conventional Wisdom on the Achievement of Reference* (Gordon & Hendrick, 1998, p. 403), proper names introduce entities into the discourse. When comprehending sentences containing a pronoun or a repeated name, the processor follows different (discourse-representation) *Construction Rules*, each of which includes a set of instructions on what the processor needs to do to assign a referent to each RE. When the processor encounters a pronoun in the input, the instructions of the *Construction Rule for Pronouns* are triggered and the processor initiates the search for a referent from a set of entities already in the current discourse representation. The processor evaluates one entity at a time in the order of syntax-based accessibility, like the Cf ranking in Centering Theory (e.g., subject > object). If the entity denoted by the subject NP of the preceding sentence is a grammatically and pragmatically appropriate candidate for the referent, then the processor associates it with the pronoun. If it is not a good candidate, then the processor moves to the entity denoted by an object NP and checks if it can be the referent.

When the processor encounters a repeated name in the input, the instructions of the *Construction Rule for Proper Names* are triggered and the processor introduces a new entity into the discourse representation. This creates a problem when the processor analyzes a discourse like *John_i hit Bill. John_i was frustrated.* This is because the processor ends up postulating two separate entities that have the same name. To establish a coreference relation between the two *Johns*, the processor applies another rule, the *Construction Rule for Equivalence* (CR.EQ), and equates the two entities. This rule requires the processor to search for an equivalent entity from the set of entities in the current discourse representation in the *reverse* order of accessibility. In the example above, the processor first evaluates BILL and then moves on to JOHN; it takes more time for the processor to process a repeated name when the referent is an entity denoted by the subject NP than when it is an entity denoted by an object NP. Gordon and Hendrick say that (i) the brief moment where two identical but separate entities coexist in the discourse representation, (ii) the time that the processor needs to reach the entity denoted by the subject NP during the referent search process, and (iii) the application of the extra CR.EQ together slow the comprehension process. This is the cause of the RNP in DPT theory.⁹

⁹ Recent studies on co-reference patterns show that various factors, such as verb type and event structure (e.g., Stevenson, Crawley, & Kleinman, 1994) and verb aspect and coherence relations (e.g., Rohde, Kelher, & Elman, 2006), influence the interpretation of subject pronouns. The Construction Rule for Pronouns, on its own, is not able to explain such results.

Yang, Gordon, Hendrick, and Wu (1999) examined native Chinese speakers' processing of subject-REs in a series of online reading studies and accounted for their results in the DPT framework. This study will be reviewed in more detail in Section 2.2.

Informational Load Hypothesis

The other processing-based approach to the RNP is the Informational Load Hypothesis (ILH; Almor, 1999). The ILH aims to account for RE-form preferences using the notions of processing cost and discourse function. Processing cost is associated with the amount of semantic representation that an RE activates. The NP *the robin* contains more lexical information than the NP *the bird* does, and it activates a more specific representation. It is assumed that an RE with more lexical information (i.e., an RE with higher informational load) incurs more processing cost.

The discourse function of REs as anaphors is mainly to trigger the reactivation of referent representations in the hearer's mind.¹⁰ The speaker might always want to use the RE that is most informative about the referent (e.g., *the robin* rather than *the bird* or *the creature*) so that he/she can maximally facilitate the hearer's reactivation process. However, such an RE consumes a big chunk of computational resources. When the hearer needs to reactivate a relatively inaccessible referent representation, the information from this sort of RE will be useful for identifying and reactivating the relevant representation; but when the hearer reactivates a highly accessible referent representation, some of the information from this RE is superfluous, and the high processing cost that is incurred due to this overly informative RE is not warranted by the function of referent identification/reactivation. Thus the ILH claims that a maximally informative RE should not be used to refer to an accessible entity unless the superfluous information serves another discourse function, such as adding new information to the existing referent representation.

For instance, in the discourse *A bird came to my yard. The robin jumped into the puddle.*, the NP *the robin* provides extra information about the (accessible) subject referent (i.e., it is not only a bird, but a robin) and so the cost-function balance is maintained. However, sometimes an RE with a relatively high informational load provides superfluous information in terms of

¹⁰ Unlike the DPT, the ILH considers both pronouns and repeated names as having the function of identifying and reactivating referent representations already in the hearer's mind.

referent reactivation but does not add new information. In the discourse *A robin came to my yard. The robin jumped into the puddle.*, the repeated NP *the robin* has a high informational load (relative to, e.g., *the creature*) but does not add new information to the referent because *a robin* and *the robin* have an equal amount of information. This lack of new information in *the robin* makes the use of the full NP less felicitous than, e.g., a pronoun. Almor conducted self-paced reading experiments using full-NP subjects with different informational loads. An increased RT was found in discourses where a repeated-NP subject was used to refer to a focused (or clefted) entity.

The increased RT is seemingly analogous to the RNP found in Gordon et al. (1993).¹¹ For them, the RNP occurs because of a violation of the Pronoun Rule (i.e., a pronoun must be used when referring to a Cb). But for the ILH, the RNP occurs because an NP with high informational load is repeated; since a repeated NP cannot add new information to the existing referent representation, the cost incurred by the repeated NP cannot be justified. This explanation was supported by results in which, e.g., the repeated-NP subject *the bird* that was used to refer to the focused entity BIRD elicited the RNP, whereas the more informative NP subject *the robin* that was used for the focused entity BIRD did *not* elicit the RNP. Almor (1999) claims that if a pronoun is the only preferred form of RE for a focused/accessible entity, then *the robin* should have also elicited the RNP.

Gelormini-Lezama and Almor (2011) and Shoji, Dubinsky, and Almor (2017) tested the processing of null and overt pronouns by, respectively, native Spanish speakers and native Japanese speakers. They claim that the ILH can explain the RNP and the *Overt Pronoun Penalty* (i.e., a significantly longer RT in sentences with an overt-pronoun subject than in sentences with a null subject). These studies will be discussed in Section 2.2.

2.1.3 Summary

This section reviewed some of the major work that accounts for how REs are used in discourse. Linguists first attempted to identify what features of discourse/text influence the speaker's choice of RE form. Givón (1983) assessed the continuity/accessibility of discourse entities using the measurements of *referential distance*, *potential interference*, and *persistence*.

¹¹ Almor (1999) did not use repeated-name subjects in his experiments, so the processing difficulty found in his study may be qualitatively different from the difficulty found in Gordon et al. (1993). For convenience, however, we will use the term *RNP* for the significantly longer RT in the (so-called) Repeated-NP condition.

Later Ariel (1990) added *saliency* and *unity* as accessibility determinants. These researchers and Gundel et al. (1993) mapped various RE forms onto scales of accessibility or cognitive status. Different scales have different RE forms, but in general, reduced RE forms such as null pronouns and unstressed overt pronouns are used to refer to highly accessible entities, whereas explicit RE forms such as proper names and full NPs are used to refer to less accessible entities. Also, these scales are considered to be universal; different languages may use different RE forms, but there should not be a language that uses a reduced form for a relatively less accessible entity or a more explicit form for a relatively more accessible entity.

The correlation between discourse accessibility and RE form underlies computational-linguistic and psycholinguistic accounts that provide empirically testable predictions. Centering Theory (Grosz et al., 1995) uses syntactic/grammatical role as the primary determinant of accessibility for English. It claims that a pair of sentences is more coherently linked when the discourse center—the entity under the focus of attention—is the entity denoted by the subject NP in both sentences (*continued center*) than when a non-center in the initial sentence is promoted to the entity denoted by a subject NP in the following sentence (*shifted center*). Also, the Pronoun Rule says that a (highly salient) discourse center must be referred to with a pronoun. In a self-paced reading task, Gordon et al. (1993) found that when a repeated-name subject was used to refer to a (highly accessible) continued center, native English speakers experienced processing difficulty, indicated by an elevated RT called the *Repeated Name Penalty* (RNP). However, the RNP disappeared when the repeated-name subject was used to refer to a (less accessible) shifted center.

Some researchers have tried to pinpoint what exactly the cause of the RNP is. For Centering Theory, the processing difficulty occurs because the Pronoun Rule is violated (i.e., something other than a pronoun is used to refer to a continued center). For Discourse Prominence Theory (Gordon & Hendrick, 1998), the main cause of the RNP is the application of an extra Construction Rule (i.e., the Construction Rule for Equivalence) to equate a new entity postulated by a repeated name with the target referent that is already in the discourse representation. For the Informational Load Hypothesis, the RNP occurs when a (so-called) repeated NP provides more information than needed to reactivate an accessible referent representation but the superfluous information does not add new information to the existing referent representation.

2.2 Processing null- and overt-pronoun subjects in null-subject languages

We will now turn to the processing of null and overt pronominal subjects in null-subject languages. This section aims to determine whether there is a “division of labor” between null and overt pronouns. The RNP found in Gordon et al. (1993) indicates just such a division for English subjects: Pronouns—the most reduced form of REs in non-null-subject languages—are preferred over repeated names when the referent is the entity denoted by the subject of the immediately preceding context sentence. Note that this entity in Gordon et al.’s stimuli (8b) is assumed to be highly accessible because the subject NP is in a syntactically higher position than any other nominal in the sentence and also because it is the first element in the sentence. Like overt pronouns and repeated names in English, null pronouns and overt pronouns in null-subject languages are two separate RE forms and so they should, in the main, have separate functions in discourse: Null pronouns—the most reduced RE form—code the highest degree of accessibility (e.g., Ariel, 1990; Givón, 1983) and so should be preferred over overt pronouns when the antecedent is the subject NP of a preceding sentence/clause.

If this is how the two types of pronouns are used, then in an experiment similar to Gordon et al.’s self-paced reading study (Experiment 4), we expect to see an interaction between RE form (Null vs. Overt Pronouns) and Transition (Continue vs. Shift).¹² There are two possible expected RT result patterns, as schematically presented in Figures 2.1 and 2.2.

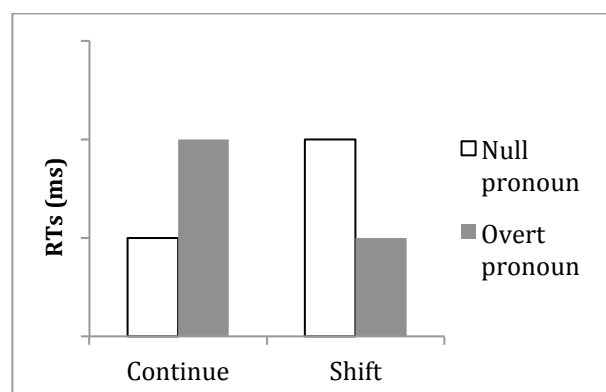


Figure 2.1. RT Pattern A indicating a division of labor between null and overt pronouns

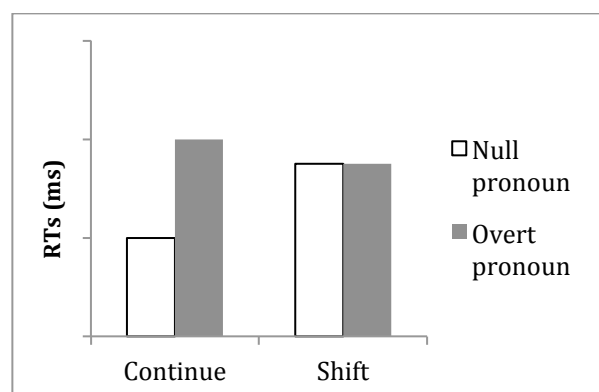


Figure 2.2. RT Pattern B indicating a division of labor between null and overt pronouns

¹² The studies reviewed here do not specifically test the predictions of Centering Theory, so they name the two Transition conditions the *Subject-Antecedent condition* and the *Object-Antecedent condition*, respectively. However, we will use *Continue* and *Shift* following Gordon et al. (1993) for the sake of consistency.

In the Continue condition of both patterns, sentences with a null-pronoun subject are read faster than those with an overt-pronoun subject. The difference in the two patterns is in the Shift condition. In Pattern A (Figure 2.1), the RT for overt pronouns is shorter than the RT for null pronouns, which suggests a preference for overt pronouns. This would occur in cases where an entity denoted by an object is clearly less accessible than an entity denoted by a subject and an overt pronoun can felicitously code the level of accessibility, or where the discourse contains two gender-mismatching entities and the gender feature of the overt pronoun helps participants identify the target referent. Lack of the gender feature on the null pronoun makes it hard for participants to shift their attention from the entity encoded in subject position (the preferred referent for the null pronoun) to the one encoded in object position.

In the Shift condition of Pattern B (Figure 2.2), the RTs in the two RE conditions are more or less the same. This would occur in cases where the level of the accessibility of the entity encoded in object position somehow does not match the level that the overt pronoun codes, or where the discourse contains two gender-matching entities and the gender feature of the overt pronoun is not helpful for referent identification.¹³ But in both Pattern A and Pattern B, the important point is that a null subject elicits a shorter RT than an overt-pronoun subject in the Continue condition; we do not expect a null subject to elicit a shorter RT in the Shift condition, because this would suggest that it is preferred regardless of the accessibility level of the referent.

In the following sections, we will first compare the processing of null vs. overt pronominal subjects in Italian and Spanish and then extend this to Chinese and Japanese. The main findings are that there is a definite division of labor between null- and overt-pronoun subjects in Italian, whereas the two types of subject pronouns are processed similarly in Chinese; the processing of null- and overt-pronoun subjects in Spanish and Japanese each falls somewhere between these two clear-cut cases, but I will suggest that the use of overt subject pronouns in Spanish and Japanese is constrained by different factors.

¹³ Gordon et al. (1993) found the RT pattern in Figure 2.2—the white bars for the Pronoun conditions and the gray bars for the Repeated-Name conditions—in English discourses with two gender-mismatching entities. The fact that in the Shift condition, the RT in the Pronoun condition was not significantly longer than the RT in the Repeated-Name condition suggests that the gender feature on the pronoun helped the participants shift their attention to the entity denoted by the object NP in the context sentence. Hudson-D’Zmura and Tanenhaus (1998), who examined the RNP in contexts with two gender-matching entities, found a pattern similar to the one in Figure 2.1. The longer RT found for pronouns in the Shift condition suggests that the gender feature on the pronoun was not helpful for referent identification.

2.2.1 Processing null vs. overt subject pronouns in Italian and Spanish

Carminati (2002) investigated how null- and overt-pronoun subjects are processed in Italian. She conducted a total of 14 experiments using various syntactic constructions in order to test her hypothesis, the Position of Antecedent Strategy (PAS), stated in (9).

- (9) The Position of Antecedent Strategy for the Italian null and overt [subject] pronouns in intra-sentential anaphora: [T]he null [subject] pronoun prefers an antecedent which is in the Spec IP position, while the overt [subject] pronoun prefers an antecedent which is not in the Spec IP position.

(Carminati, 2002, p. 57, [1])

Like the Cf ranking for English in Centering Theory, the PAS assumes that (i) the syntactic positions of NPs determine the accessibility of the entities that they denote and (ii) the degree of accessibility influences the choice of RE form. The null subject is likely to take a syntactically prominent, highly accessible entity (e.g., an entity denoted by a pre-verbal subject) as its referent, whereas the overt-pronoun subject is likely to take a syntactically less prominent, less accessible entity (e.g., an entity denoted by an object) as its referent. A piece of supporting evidence comes from Experiment 1, in which native Italian speakers read bi-clausal sentences with two gender-matching (GM) entities, like those in (10).

- (10) a. Dopo che Mario ha messo in imbarazzo Giorgio di fronte a tutti, **ø/lui** si è scusato ripetutamente.

‘After Mario embarrassed Giorgio in front of everyone, (he)/he apologized repeatedly.’

- b. Quando Mario ha messo in imbarazzo Giorgio di fronte a tutti, **ø/lui** si è offeso tremendamente.

‘When Mario embarrassed Giorgio in front of everyone, (he)/he was very offended.’

(adapted from Carminati, 2002, p. 69)

Each of the sentences had two RE conditions, i.e., a null subject pronoun indicated by “ø” vs. an overt subject pronoun *lui/lei* (‘he’/‘she’), and the plausibility of the main clause disambiguated the antecedent of the pronouns (i.e., the preceding subject NP in [10a] vs. the preceding object

NP in [10b]). It was predicted that if the PAS constrains Italians' pronoun interpretation, then when processing a null subject, participants should associate it with an entity denoted by the subject of the preceding clause and hence more quickly process the main clause in (10a) than the main clause in (10b); by contrast, upon encountering an overt-pronoun subject, they should associate it with an object entity and more quickly process the main clause in (10b) than that in (10a).

The mean residual RTs from the main clauses in Carminati (2002) are plotted in Figure 2.3, which was produced based on the mean residual RT values reported for the four discourse conditions in Carminati (2002). All the figures below use the same arrangement of the conditions so that readers can easily compare RT patterns across experiments.

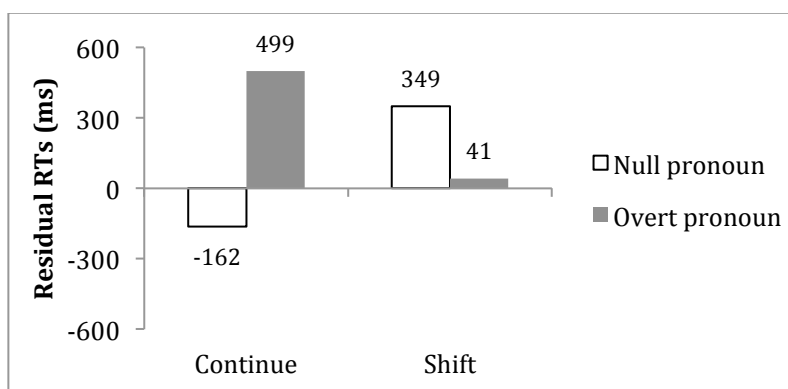


Figure 2.3. Mean residual RTs in Carminati's (2002) Experiment 1 (GM entities)

The statistical analyses revealed a significant interaction between RE and Transition. From the figure, it can be said that the null pronoun was preferred in the Continue condition and the overt pronoun was preferred in the Shift condition.¹⁴ Carminati found a similar result in the offline interpretation task in Experiment 2. Italian natives read globally ambiguous sentences like *Marta*

¹⁴ Carminati (2002) explains the RT patterns by comparing RTs in each of the RE conditions: In the Null-Pronoun conditions (the white bars in Figure 2.3), the RT in the Continue condition was faster than the RT in the Shift condition, whereas in the Overt-Pronoun conditions (the gray bars in Figure 2.3), the opposite pattern was obtained. She looked at RTs this way because her interest was which NP is preferred as antecedent for each type of subject pronoun. However, my interest is which RE form is preferred in each Transition condition, so I will (visually) compare RTs between the two RE conditions in each of the Transition conditions.

Notice that even with residual RTs, the comparisons within each RE condition in this particular experiment may not be so meaningful because the materials in the Continue condition (e.g., ... *ø/lui si è scusato ripetutamente* ['he apologized repeatedly']) were different from those in the Shift condition (e.g., ... *ø/lui si è offeso tremendamente* ['he was very offended']).

*scriveva frequentemente a Piera quando **ø/lei** era negli Stati Uniti* (‘Marta wrote a letter to Piera when (she)/she was in the United States’), and they chose the matrix subject NP (e.g., *Marta*) as the antecedent of the null subject 81% of the time and the matrix object NP (e.g., *Piera*) as the antecedent of the overt subject pronoun 83% of the time.

This clear difference between null vs. overt subject pronouns in Italian motivated Filiaci, Sorace, and Carreiras (2014) to examine the processing of pronouns in Spanish. Null subjects in Spanish, as in Italian, preferentially take as antecedent the subject of a preceding sentence as in (11), and overt subject pronouns, e.g., *él/ella/ellas* (‘he’/‘she’/‘they.fem.’), are generally used in contrastive/emphatic contexts (e.g., Luján, 1986) as in (12).

(11) *María e Hilda no almorzaron hoy. **ø/*/?Ellas** tendrán mucho hambre.*

‘Maria and Hilda did not eat today. (They)/*/?They must be hungry.’

(12) *Nunca pensé que tuvieras que ir a buscar el paquete. Juan_i me dijo que ***ø/él_i** lo recogería.*

‘I never thought you would have to go get the package. John told me *(he)/he would get it.’

(adapted from Rothman, 2009, p. 945, [4] & [9])

Similarity between the two languages in the use of null- and overt-pronoun subjects predicts that Spanish natives would process these pronouns similarly to how Italian natives do. Filiaci et al. (2014) tested both native Italians using the stimuli from Carminati’s (2002) Experiment 1 and native Spanish speakers using the same stimuli translated into Spanish. The RT results from the Italian group are provided in Figure 2.4 and those from the Spanish group in Figure 2.5.

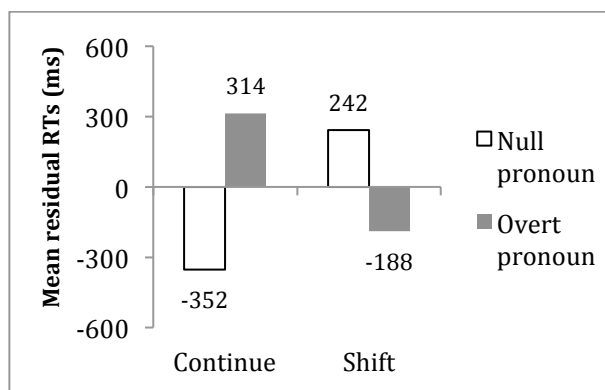


Figure 2.4. Mean residual RTs (GM entities) for the Italian group in Filiaci et al. (2014)

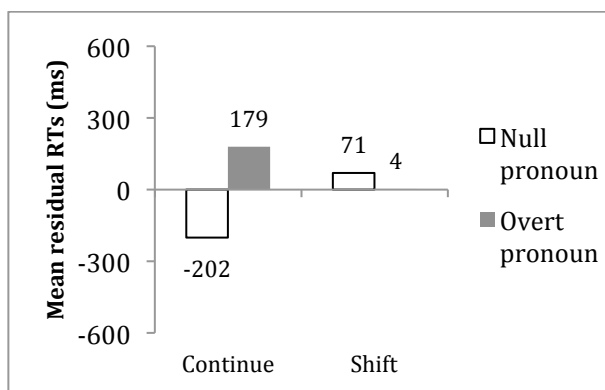


Figure 2.5. Mean residual RTs (GM entities) for the Spanish group in Filiaci et al. (2014)

The statistical analyses revealed that there was a three-way interaction of RE, Transition, and Language, suggesting that overall, Italian and Spanish speakers processed the subject-REs differently. Unfortunately, Filiaci et al. did not analyze the interaction of RE and Transition in each language group; for their research questions, they were interested in the interaction of Transition and Language in each RE condition (see fn. 14). This makes it hard for us to see which RE form was preferred in each Transition condition, but they did report that there was a significant interaction of Transition and Language only when the RE was an overt pronominal subject: In the Italian group, the RTs elicited by sentences with an overt-pronoun subject were significantly different between the Continue and Shift conditions (314 ms vs. -188 ms); but in the Spanish group, the RT difference was *not* statistically significant (179 ms vs. 4 ms). Filiaci et al. interpreted this lack of an RT difference in the Spanish group as indicating that overt subject pronouns in Spanish are not as sensitive to structure-based accessibility as overt subject pronouns in Italian are. This is why the entity denoted by the object NP, which is assumed to be relatively low in accessibility, did not facilitate the processing of the overt subject pronoun. They also discussed an alternative possibility: Since Italian *lui* ('he') and *lei* ('she') are, according to Cardinaletti & Starke (1999), strong pronouns but Spanish *él* ('he') and *ella* ('she') are, Filiaci et al. maintain, weak pronouns, the differences in lexical properties might have influenced how overt pronouns were processed.¹⁵

¹⁵ See Cardinaletti and Starke (1999) for discussion of strong and weak pronouns across languages.

The lack of a subject-RE preference in the Spanish Shift condition is also evident in the results of Alonso-Ovalle, Fernández-Solera, Frazier, and Clifton (2002). In their offline interpretation task, Spanish speakers read globally ambiguous two-sentence passages like *Juan pegó a Pedro. ø/Él está enfadado*. (‘Juan hit Pedro. [He]/He was angry.’). They chose the matrix subject as the antecedent of the null subject pronoun 73% of the time; but for the overt subject pronoun, they chose the matrix object as the antecedent only 50% of the time, i.e., the overt subject pronoun is not strongly associated with an entity denoted by the object NP. This sharply contrasts with the results from Carminati’s Experiment 2 mentioned above, which elicited a strong object-antecedent preference for the overt subject pronoun (83%).

Going back to Filiaci et al. (2014) and our predicted RT patterns at the beginning of this section, the RT patterns in the Italian group are similar to Pattern A (Figure 2.1) and those in the Spanish group are similar to Pattern B (Figure 2.2). Although Spanish speakers did not prefer the overt subject pronoun in the Shift condition as strongly as Italian speakers did, both groups preferred the null pronoun in the Continue condition. This supports the idea that the two types of pronouns serve different functions in discourse.

The discussion above was about the processing of null and overt subject pronouns in discourses with two gender-matching entities. For processing patterns in discourses with two gender-mismatching (GMM) entities, I am not aware of any study that directly compared Italian and Spanish speakers. However, the results from different studies seem to show similar patterns in the two languages. Carminati (2002) conducted another self-paced reading experiment (Experiment 8) in Italian using sentences like those in (13), in which the referents were identifiable by the overt pronominal subjects and the gender markers on the adjectives.¹⁶ From the perspective of the PAS, the use of the overt pronoun in (13a) is odd because the only legitimate antecedent within the sentence is the subject NP. However, Carminati found in a previous experiment that Italian speakers associate the overt pronoun with a subject if it is the only legitimate antecedent in the linguistic context. The question here is whether this exceptional case makes the RT in the Overt-Pronoun condition as fast as the RT in the Null-Pronoun condition in sentences like (13a) and (13b).

¹⁶ Experiment 8 in Carminati (2002) had another condition that contains only one entity (e.g., *Quando Mario canta, ø/lui è contento* ‘When Mario sings, [he]/he is happy [masc.]’), but here we look at only the Two-Entity conditions as these are directly related to the present discussion. The RT patterns for the One-Entity condition were almost identical to the RT patterns for (13a).

- (13) a. Quando Mario chiama Liliana, **ø/lui** è contento.
 ‘When Mario calls Liliana, (he)/he is happy (masc).’
 b. Quando Mario chiama Liliana, **ø/lei** è contenta.
 ‘When Mario calls Liliana, (she)/she is happy (fem).’

(Carminati, 2002, pp. 204–205)

The raw RTs from the main clauses are summarized in Figure 2.6.

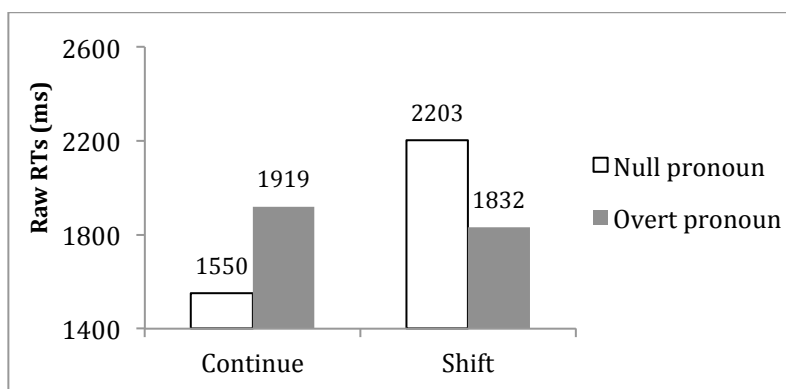


Figure 2.6. Mean raw RTs in Carminati's (2002) Experiment 8 (GMM entities)

The statistical analyses show that there was a significant main effect of Transition (i.e., longer RTs in the Shift condition), which suggests that it takes some time to shift the focus of attention from the entity denoted by the subject NP (e.g., MARIO) to the entity denoted by the object NP (e.g., LILIANA). There was also a significant interaction of RE and Transition, suggesting that null pronouns elicited a shorter RT than overt subject pronouns did in the Continue condition but the pattern was different in the Shift condition. The analyses were done on raw RTs and so we cannot know how the differences in clause length (i.e., three extra letters in the Overt-Pronoun [*lui/lei*] conditions than the Null-Pronoun conditions) might change the RT patterns. But given that there was a significant interaction of RE and Transition in the GM context (Experiment 1 discussed above), it would not be surprising if a similar pattern emerged in the GMM context.

Gelorimini-Lezama and Almor (2011) compared the processing of null pronouns, overt pronouns, and repeated names in Spanish; their stimuli had the three RE types in subject position as in (14) and (15). Unlike the experiments reviewed above, this experiment manipulated the

context sentences by switching the gender-mismatching subject and object NPs in the first sentence so that RTs from identical critical sentences can be compared.

- (14) a. Juan se encontró con María.
 ‘Juan met with María.’
 b. **ø/Él/Juan** la vio triste.
 ‘(He)/He/Juan found her sad.’

(Gelormini-Lezama & Almor, 2011, p. 444, Table 1)

- (15) a. María se encontró con Juan.
 ‘María met with Juan.’
 b. **ø/Él/Juan** la vio triste.
 ‘(He)/He/Juan found her sad.’

(Gelormini-Lezama & Almor, 2011, p. 444, Table 1)

The raw RT data are summarized in Figure 2.7. The results are that the Continue condition had a significantly shorter RT in the Null-Pronoun condition than in the other RE conditions, and that the Shift condition had a significantly longer RT in the Null-Pronoun condition than in the other RE conditions. This clearly shows a null-pronoun preference for a subject antecedent and overt-pronoun and repeated-name preferences for an object antecedent. Gelormini-Lezama and Almor (2011) named the increased RTs caused by an overt pronoun in the Subject-Referent condition (14) the *Overt Pronoun Penalty* (OPP).

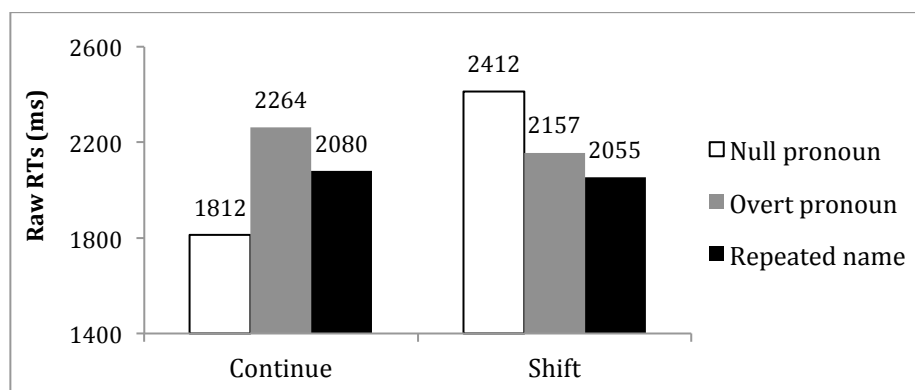


Figure 2.7. Mean raw RTs in Gelormini-Lezama & Almor's (2011) Experiment 1 (GMM entities)

Since the PAS is solely concerned with the processing/interpretation of (subject) pronouns, Gelormini-Lezama and Almor explained the results using the Informational Load Hypothesis (ILH; see Section 2.1.2). In the Continue condition, the semantic information from both an overt pronoun and a repeated name was superfluous in terms of identifying and reactivating the representation of a highly accessible discourse entity. Also, the REs did not add new information to the existing representations of the referent. The imbalance between the cost and function resulted in the OPP and the Repeated Name Penalty.

In sum, in the types of discourses tested in the studies reviewed above, a clear division of labor is present: (i) null-pronoun subjects are preferred over overt-pronoun subjects in the Continue condition in both Italian and Spanish; (ii) overt-pronoun subjects seem to be preferred over null-pronoun subjects in the Shift condition in contexts with gender-mismatching entities; but (iii) overt-pronoun subjects are strongly preferred in the Shift condition in Italian but not in Spanish when the context has gender-matching entities. Although null subject pronouns in these typologically close languages are processed similarly, (iii) suggests that subtle cross-linguistic differences can also emerge in the processing of overt subject pronouns.

2.2.2 Processing null vs. overt subject pronouns in Chinese

Our next question is whether the overt pronouns *tā* in Chinese (他 [‘he’], 她 [‘she’], 它 [‘it’], which are phonologically identical¹⁷ but orthographically distinct) and the null pronoun are processed differently.¹⁸ Traditional descriptions of RE use in Chinese note some differences in the use of the two types of pronouns. However, unlike in Italian and Spanish, the differences in Chinese are not necessarily tied to a continuation vs. shift of discourse focus or to [± contrastive focus]. Chu (1998) compared the claims of Li (1985), Chen (1986), and Xu (1995) and found the following generalizations in regard to subjects: (i) Null pronouns are used to indicate the topic in a topic chain (i.e., a set of clauses that are linked to each other with a common discourse topic; Tsao, 1979) or the high continuity/accessibility of a topic; (ii) overt pronouns are used to mark a boundary of a topic chain or to code the intermediate-level accessibility of an entity; and (iii) names and full NPs are used to introduce a referent into the discourse, to mark a major break

¹⁷ The diacritic above *a* indicates the first tone.

¹⁸ Chinese overt pronouns do not change form for grammatical function. *Tā* (masc.) can be translated as ‘he,’ ‘him,’ or ‘his’ depending on where it appears within a sentence.

in discourse (e.g., the beginning of a new paragraph), to retrieve a long displaced topic, and to signal the shift of a topic, scene, or activity.

Li and Thompson (1979) also pointed out that Chinese speakers prefer to use an overt subject pronoun when the “conjoinability” between clauses decreases. In their offline questionnaire studies, native Chinese speakers were asked to read three short texts in which the subject of each clause/sentence was left blank and to insert an overt pronoun whenever they felt it was necessary. The results showed that there were three positions where more than a half of the participants inserted an overt pronoun. The first was at a switch between foreground information and background information, as in the following part of a discourse (translated into English): *(He) came in the door, (he) saluted everyone with his hands, then (he) immediately took the seat of honor, **he** was surnamed Xià* (p. 331). The second position was after time phrases and contrastive expressions like *however* and *but*: *This Wang-mian was gifted, (he) was not more than twenty years of age, (he) had already mastered everything in astronomy, engineering, and classics[;] however, **he** had a different personality* (p. 332). The third position was a switch of turns in conversation. When a speaker utters “Zhāng-sān is slick looking. (He) is a clown,” he/she prefers to use a null-pronoun subject in the second sentence, but when Speaker A utters the first sentence and Speaker B the second sentence, Speaker B is likely to use an overt-pronoun subject (p. 333).

Unlike in Italian and Spanish, overt subject pronouns in Chinese can readily be used to continue a discourse topic. All the examples above show overt subject pronouns taking as antecedent the subject of a preceding clause. However, this does not mean that they are not used when an object NP is the antecedent. Tai (1978) states that an overt subject pronoun should be used to shift the discourse topic, as in this sequence of sentences (translated into English): *People in the village all respect Xiao Laoda very much. Whenever **he** [= Xiao Laoda] says something or makes a decision, everyone listens to him* (p. 310). Tai also says that a repeated-name subject can likewise be used for topic shift, but when the referent is a highly accessible entity, an overt subject pronoun is preferred (in the example above, XIAO LAODA is the story’s main protagonist and thus higher in accessibility than the entity denoted by the subject of the first sentence, i.e., PEOPLE IN THE VILLAGE).

Taken together, discourse analyses reveal that one of the factors that distinguish the use of null and overt subject pronouns in Chinese is the degree of semantic continuity; a null subject

is preferred when sequential sentences form a chain on the same topic; but when the chain breaks (for various reasons), an overt subject pronoun becomes more appropriate.

How can we apply these findings to the processing of Chinese null and overt pronouns? Since Chinese overt subject pronouns are not necessarily associated with focus shift or contrastive focus, null and overt subject pronouns are predicted to be processed equally faster than repeated-name subjects in the Continue condition. Overt subject pronouns may even be processed faster than their null counterpart in cases where the transition from a context sentence to the following critical sentence is somewhat discontinuous. In the Shift condition, null and overt pronominal subjects should be processed similarly in contexts with two gender-matching entities because the gender cue on the overt pronoun is not helpful for shifting the discourse topic. In written contexts with two gender-mismatching entities, by contrast, overt subject pronouns should be processed faster than null subjects because the gender cue helps topic shifting.

Yang et al. (1999) conducted a sentence-by-sentence self-paced reading study, following Gordon et al.'s (1993) study with English speakers. In Experiment 3, native Chinese speakers read three-sentence passages like (16a-b-c) and (16a-b'-c).

- (16) a. Xiaomei gaoshu Xiaorong huayuan li ying zhong sucai er bu zhong hua.
'Xiaomei (female) told Xiaorong (female) that vegetables, instead of flowers, should be planted in the garden.'
- b. **ø/Ta** (fem.) renwei sucai bi hua haiyao shiyong.
'(She)/She thought vegetables are of more utility than flowers.'
- b'. **ø/Ta** (fem.) que renwei sucai han hua dou yao zhong.
'(She)/She thought, however, that both vegetables and flowers should be planted.'
- c. Huayuan de shiyong ji guihua shi henda de xuewen.
'The usage and planning of a garden are worth studying.'

(Yang et al., 1999, p. 732, Table 6)

The discourse (16a) introduced two gender-matching entities, and the pronominal subjects in the critical sentences (16b) and (16b') had as their antecedent, respectively, the subject NP and the object NP of the context sentence. In Experiment 4, Yang et al. created contexts with two

gender-mismatching entities by replacing the subject in, e.g., (16a) with a subject denoting an opposite-gender entity (e.g., replacing XIAOMEI [female] with DAXING [male]) and by replacing *tā* (fem.) in the critical sentence with *tā* (masc.).

The raw RTs for the critical sentences in Experiments 3 and 4 can be found in Figures 2.8 and 2.9, respectively. (Since the authors did not provide the exact RT values, the bars in the figures represent approximate RTs from Figures 3 and 4 in Yang et al., 1999.)

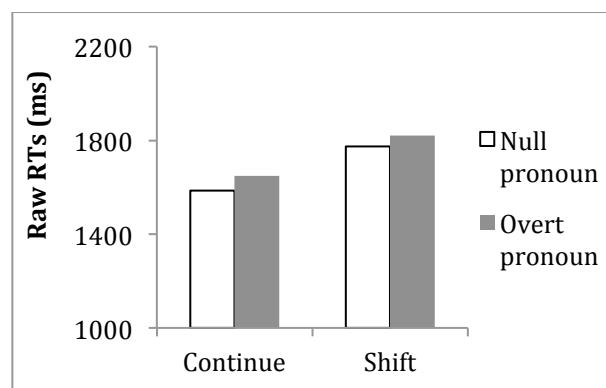


Figure 2.8. Approximate mean raw RTs in Yang et al.'s (1999) Experiment 3 (GM entities)

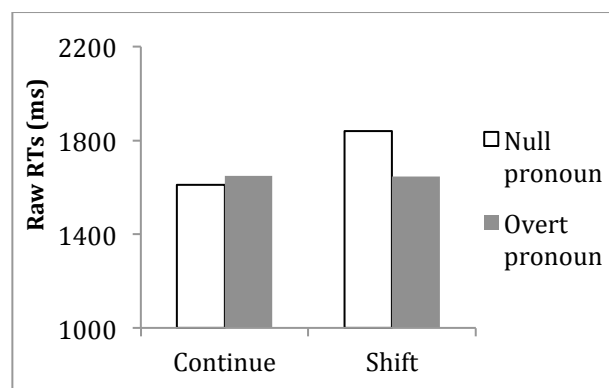


Figure 2.9. Approximate mean raw RTs in Yang et al.'s (1999) Experiment 4 (GMM entities)

In Experiment 3 with gender-matching entities, the null- and overt-pronoun subjects were processed similarly in each Transition condition. But in Experiment 4 with gender-mismatching entities, there was a significant interaction of RE and Transition. Figure 2.9 indicates that in the Shift condition, sentences with an overt pronominal subject were processed faster than those with a null subject. These patterns support the prediction that null and overt subject pronouns in Chinese are processed similarly unless the gender cue is useful for shifting the discourse topic.

The two figures above show similar RT patterns between null and overt pronouns in the Continue condition, so it is not clear whether the RTs are indicating a preference or dispreference of RE form. Yang et al. conducted another experiment (Experiment 2), similar to Experiment 3, with overt-pronoun and repeated-names subjects. Figure 2.10 shows the RT patterns.

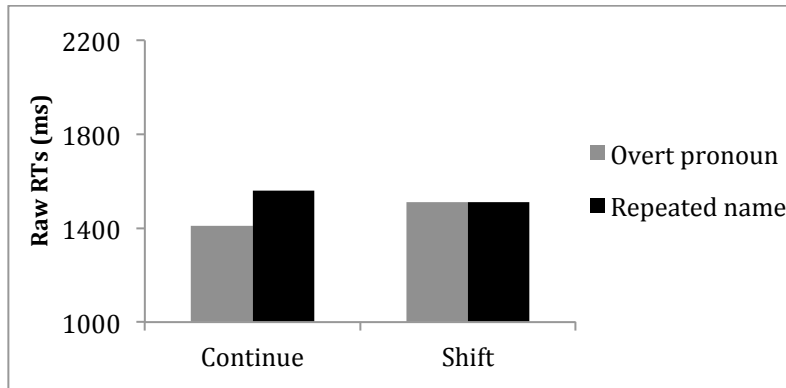


Figure 2.10. Approximate mean raw RTs in Yang et al.'s (1999) Experiment 2 (GMM entities)

As in English (Gordon et al., 1993), an overt-pronoun subject elicited a shorter RT than a repeated-name subject did in the Continue condition; this suggests that for Chinese, null- and overt-pronoun subjects are indeed preferred over repeated-name subjects in this condition.

Yang et al. (1999) explained the RT patterns of the three RE conditions using Discourse Prominence Theory (DPT; Gordon & Hendrick, 1998). In DPT, as described in Section 2.1.2, when the processor parses a pronoun, it searches for a suitable referent in the discourse representations; but when it encounters a repeated name, it postulates a new entity and then later equates the new entity with the entity already having the same name in the representation. The application of the extra CR.EQ rule (the Construction Rule for Equivalence) causes the RNP (the Repeated Name Penalty). Yang et al. explained the *lack* of the OPP (the Overt Pronoun Penalty) in the experiments with null and overt subject pronouns by treating the two types of pronouns as a single class. Whether the processor encounters a null pronoun or an overt pronoun, it follows the same instructions of the Construction Rule for Pronouns. When the gender cue of the overt pronoun is useful to shift the discourse focus, the processor uses the cue and quickly associates the overt pronoun with an entity denoted by the object.

Obviously, however, the DPT cannot explain the division of labor between null and overt subject pronouns in Italian and Spanish. Gelormini-Lezama and Almor (2011) argue that the ILH can explain the RT patterns in Chinese as well as those in Spanish. They claim that:

Because Chinese lacks a rich verbal morphology, the gender and number information carried by the overt pronoun in Chinese makes [it] more useful than its Spanish counterpart. In contrast, the richer morphology of the Spanish language makes **the verbal suffix crucial to the interpretation of the anaphor** [emphasis MM], thus making the semantic features of the overt pronoun less important for correctly identifying the antecedent. (p. 452)

For them, the ostensibly superfluous semantic information (i.e., gender) from Spanish overt pronouns does not add new information to the referent, which leads to Spanish overt subject pronouns incurring a higher processing cost (the OPP) than null subject pronouns.

However, this argument does not go through, because Spanish verbs do *not* inflect for gender (although they do inflect for number [and person] of the subject, a fact which is irrelevant to all the studies discussed above).¹⁹ Unless the sentence meaning (plausibility) is sufficient for readers to find the intended referent (i.e., the information on overt subject pronouns is superfluous in terms of the search for the intended referent), the gender feature on such a pronoun in (written) Spanish should be just as informative as that of Chinese overt subject pronouns. In short, the ILH cannot account for the different processing patterns in Spanish and Chinese. At this point, I am not aware of a processing account that can explain all the RT patterns that we have seen above.

2.2.3 Processing null vs. overt subject pronouns in Japanese

Like Chinese overt pronouns, Japanese overt pronouns *kare/kanozō* ('he'/'she') carry gender (and number) features. However, it is well known that Japanese speakers do not use overt pronouns frequently. Evidence for this comes from Gundel et al.'s (1993) discourse-analysis data. They analyzed various sources of native data in Chinese, English, Japanese, Russian, and Spanish and examined which RE form(s), regardless of grammatical function, are used to refer to entities in the six cognitive statuses of the Givenness Hierarchy. Table 2.1 shows the proportions of null and overt pronouns out of all RE forms used for (the most accessible) *in-focus* entities.

¹⁹ I am thankful to Bonnie D. Schwartz for pointing this out.

Table 2.1. Pronouns used to refer to *in-focus* entities in five languages (Gundel et al., 1993)²⁰

Pronoun	Chinese	English	Japanese	Russian	Spanish
Null	25/90 (28%)	N/A	87/125 (70%)	18/97 (19%)	64/174 (37%)
Overt	40/90 (44%)	214/246 (87%)	4/125 (3.2%)	51/97 (53%)	30/174 (17%)

It is clear that Japanese speakers strongly preferred to use null pronouns for accessible entities. There are only four tokens of overt pronouns in Table 2.1, and these were the only overt pronouns out of *all* REs in the Japanese data ($n = 363$). The other null-subject languages used overt pronouns at much higher rates. Clancy (1980), who looked at data from a story-telling task with 20 English speakers and 20 Japanese speakers, reported that she found no overt pronoun in the Japanese data. Furthermore, Shibata (2013) asked 10 native Chinese speakers and 10 native Japanese speakers to watch a 6.5-minute video clip and retell the story. The Japanese speakers produced only 2 tokens of *kare* (2/726 subject-REs = 0.3%), whereas the Chinese speakers produced 271 tokens of *tā* (271/1015 subject-REs = 27%).

What makes Japanese natives reluctant to use overt pronouns? There is a controversy among Japanese linguists about whether *kare* and *kanozyo* should in fact be categorized as “overt pronouns.” Mikami (1957) and Kuroda (1965) state that they are not pronouns; they share properties with common nouns. Hoji (1990) says that Japanese does not have so-called “personal pronouns” because overt forms in Japanese do not have the [+pronominal] feature that is subject to Principle B of the Binding Theory. Hoji (1991) further argues that the *ka-* in *kare/kanozyo* behaves like the *a-* in the demonstrative *are* (‘that’), which is part of the *ko-so-a-do* paradigm of Japanese deictics. For example, when the forms *ko*, *so*, *a*, and *do* are followed by the morpheme *-re*, *kore* (‘this thing’) refers to an object that is close to the speaker, *sore* (‘that thing’) refers to an object that is far from the speaker and close to the hearer, *are* (‘that thing’) refers to an object that is far from both the speaker and the hearer, and *dore* (‘which [thing]’) refers to one of three or more objects. The forms *ko*, *so*, *a*, and *do* can also be combined with *-no* and used with a

²⁰ The coding protocol used in Gundel et al. (1993) considers as *in-focus* entities both those denoted by the subject NP (“the interpretation of the main clause subject or the syntactic topic in the immediately preceding sentence/clause” [Gundel et al., 2006, p. 1]) and those denoted by an object NP (“part of the interpretation of a previous part of the same sentence” [p. 2]).

noun, as in *ano hito* ('that person'). Hoji (1991) and others say that *kare/kanozyo* can be used in contexts where *ano hito* is used. They argue that there seems to be a close relationship between *kare/kanozyo* and a distal demonstrative.

However, Noguchi (1997) still considers *kare/kanozyo* to be personal pronouns because, like English pronouns, they have the ability to refer to a human entity and they are referentially more 'defective' than proper names (i.e., they cannot recover their referents by themselves). But *kare* and *kanozyo* do, Noguchi maintains, share some properties with nouns: (i) they are an open-class item (e.g., a few other forms [*yatu* ('that guy' with a derogatory meaning), *aitu* ('that guy' derived from (*a*)*yatu*), etc.] can be created and used for a third person);²¹ (ii) they can be modified by adjectives (e.g., *tiisai kare* 'small he'); and (iii) they can be interpreted as 'boyfriend'/'girlfriend.' These facts led Noguchi to categorize *kare/kanozyo* as N(oun)-pronouns and English pronouns as D(eterminer)-pronouns (for further discussion, see Noguchi, 1997). Since what is crucial for the present study is the ability of *kare/kanozyo* and an NP to corefer to a discourse entity, I will follow Noguchi and take them to be overt pronouns (but see the Discussion section in Chapter 3).

Then we need to go back to the question, why are *kare* and *kanozyo* not used more frequently if they are overt pronouns? The literature on this issue discusses at least two reasons. The first reason is that *kare/kanozyo* sound "foreign" and so Japanese people avoid using them. Obana (2003) says that the terms *kare* and *kanozyo* were created in the mid-19th century to translate European literature. She analyzed 48 novels in Japanese and found that *kare/kanozyo* are rarely used in Japanese historical novels but are used quite liberally in novels that deal with foreign countries and people. (It is also my impression that an overt pronoun is more likely to be used in formal written work than in informal conversation.)

The use of Japanese overt pronouns is further restricted for socio-cultural reasons. When the speaker uses an overt pronoun, he/she should not only know the referent personally but also be about equal in social status as the referent. Using overt pronouns to refer to superiors is considered inappropriate (Hinds, 1978). For instance, a professor and the president of a company are generally high in social status, but even if a Japanese speaker knows them personally, he/she would avoid using *kare/kanozyo*; instead, he/she would add a job title to the referents' last names

²¹ Because *yatu*, *aitu*, *ano hito*, etc. can be used to refer to third-person entities, a division of labor can occur between these REs and the null pronoun in certain contexts; *yatu* and *aitu* have a derogative meaning, so they sound natural when the hearer knows the speaker's attitude toward the referent is less than positive.

(e.g., *Tanaka sensee* ‘Teacher/Professor Tanaka,’ *Yamada syatyoo* ‘President Yamada’). Also, overt pronouns are not used to refer to family members, as kinship terms (e.g., *hahaoya/okaasan* ‘mother,’ *otooto* ‘younger brother’) are strongly preferred. For those whom the speaker does not know personally, he/she will use expressions like demonstrative + N phrases (e.g., *sono/ano hito* ‘that person’) and occupation terms (e.g., *basu-no untensyu* ‘bus driver,’ *hana-ya-san* ‘florist’).

The entities that are most likely to be associated with overt pronouns are the speaker’s friends. In Hinds’ (1978) analysis of an interview between two Japanese adult females, the interviewee mentioned her friends and Japanese women in general, but she used *kanozyo-tati* (‘they [fem.]’) only when referring to her friends. However, even in that context, the *kanozyo-tati* can easily be replaced by *watasi-no tomodati* (‘my friends’) or *sono tomodati* (‘the friends’). A friend can be referred to with *kare/kanozyo* (without the plural morpheme *-tati*), but a null pronoun or a repeated name is used more frequently.

Remember that Li and Thompson (1979) found three positions where more than a half of their Chinese participants preferred to use an overt pronoun instead of a null pronoun. The first position was a switch from the foreground to the background, as in (the English translation) (*He came in the door, (he) saluted everyone with his hands, then (he) immediately took the seat of honor, **he** was surnamed Xià* (p. 331). The second position was immediately after a time expression or a contrastive expression like *however* and *but*, as in *This Wang-mian was gifted, (he) was not more than twenty years of age, (he) had already mastered everything in astronomy, engineering, and classics[;] however, **he** had a different personality* (p. 332). When these sentences are translated into Japanese, the overt pronoun *kare* can replace the overt pronoun *tā*; but as a native Japanese speaker, I would prefer to use *sono otoko-wa* (‘the man’-TOP) for the first case and either the null pronoun or the repeated name *Wang-mian* in the second case.

These historical and socio-cultural factors greatly constrain the use of overt pronouns in Japanese. But how might this fact influence the processing of them? One possibility is that Japanese overt pronouns are simply dispreferred, regardless of whether the antecedent is a subject or an object. These overt pronouns sound “foreign,” and it is difficult to create felicitous contexts for them in reading-experiment stimuli. Such stimuli usually avoid known entities and events so that participants will be unable to contrive a personal relationship or (un)equal social statuses between the stimuli-writer and the discourse entities at issue. Participants can still retrieve messages from sentences with an overt pronoun, but they need to overcome or ignore all

the unnaturalness that comes with it. Another possible processing pattern is that despite the unnaturalness of an overt Japanese pronoun in sentences, its gender cue is still useful for shifting the discourse topic. If this is the case, then in contexts with two gender-mismatching entities, overt subject pronouns would be preferred over null subjects in the Shift condition.

Shoji et al. (2017) conducted a sentence-by-sentence self-paced reading experiment to examine native Japanese speakers' subject-RE preferences in discourse. Participants read two-sentence passages like (17a-b) and (17a-b').²²

- (17) a. Taku-ga basutee-de Kazuko-o miokutta.
 Taku-NOM bus stop-at Kazuko-ACC saw off
 'Taku saw off Kazuko at the bus stop.'
- b. **ø/Kare-wa/Taku-wa** Kazuko-ni te-o futta.
 (he)/he-TOP/Taku-TOP Kazuko-DAT hand-ACC waved
 '(He)/He/Taku waved his hand to Kazuko.'
- b'. **ø/Kanozyo-wa/Kazuko-wa** Taku-ni te-o futta.
 (she)/she-TOP/Kazuko-TOP Taku-DAT hand-ACC waved
 '(She)/She/Kazuko waved her hand to Taku.'

(Shoji et al., 2017, pp. 97–98, Table 1)

The first sentence introduces two gender-mismatching entities using proper names like 拓 ('Taku') and 和子 ('Kazuko'). The names contain the same numbers of characters and moras as the overt pronouns 彼 (*kare* 'he') and 彼女 (*kanozyo* 'she'). This design makes it possible to directly compare the raw RTs between the Overt-Pronoun conditions and the Repeated-Name conditions, although it is still necessary to exclude effects of sentence-length differences when comparing these conditions with the Null-Pronoun condition.

²² Shoji et al. (2017) had five Subject-RE conditions in the critical sentence: (i) Null pronoun, (ii) Overt pronoun with *-wa*, (iii) Overt pronoun with nominative *-ga*, (iv) Repeated name with *-wa*, and (v) Repeated name with *-ga*. Since the experiments in this dissertation consistently use *wa*-marked overt pronouns and *wa*-marked repeated names, only conditions (i), (ii), and (iv) will be reviewed here. (For the sake of completeness: The RT results in Shoji et al. indicate that the *ga*-marked overt pronouns and *ga*-marked repeated names were processed more slowly than their *wa*-marked counterparts, so the OPP and the RNP that were found for sentences with a *wa*-marked subject [see below] were also found for sentences with a *ga*-marked subject.)

The mean RTs in each condition are shown in Figure 2.11, which was produced based on the approximate RT values from Figure 1 in Shoji et al. (2017).

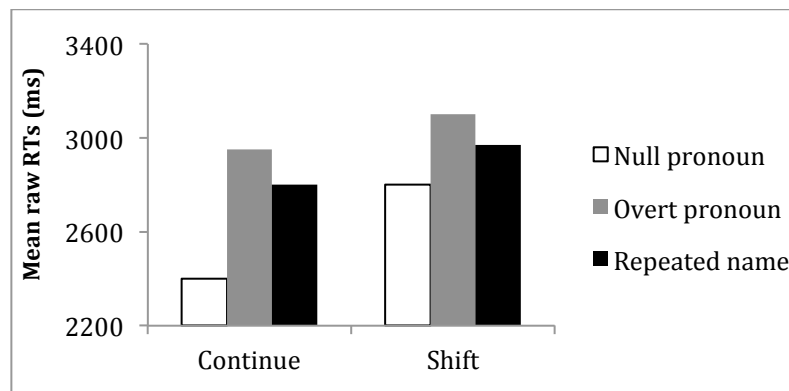


Figure 2.11. Approximate mean raw RTs in Shoji et al. (2017) (GMM entities)

The RT analyses revealed a significant interaction between RE and Transition when the Null- and Overt-pronoun conditions were compared as well as when the Null-Pronoun and Repeated-Name conditions were compared. Shoji et al. claim that the first interaction is evidence of the OPP and the second interaction is evidence of the RNP. They attributed the occurrence of the OPP to the superfluous pragmatic and socio-cultural information that Japanese overt pronouns carry. They do not specify what exactly caused the RNP, but they do say that the effect is comparable to the RNP found in previous studies.

There are two questions about the results and interpretations. One is that it is not clear which subject-RE form was *preferred* in the Shift condition. The RT patterns of the Null- vs. Overt-Pronoun conditions in Figure 2.11 (as well as their statistical comparisons) indicate that the RT difference between these two RE conditions was larger in the Continue condition than in the Shift condition. This suggests that in the Shift condition, (i) the RT advantage of the null pronoun in the Continue condition was weakened (i.e., RT increase) and/or (ii) the RT disadvantage of the overt pronoun in the Continue condition was relaxed (i.e., RT decrease). It is still noteworthy that among the three RE conditions in the Shift condition, the RT in the Null-Pronoun condition is numerically the shortest. Yet, Shoji et al. report that the RT difference between the Null- and Overt-Pronoun conditions was significant in both Transition conditions. Does this mean that a null pronoun is preferred even when the referent is a relatively inaccessible discourse entity? This is where the analysis of residual RTs might become crucial. If the residual

RTs also show a shorter RT for the Null-Pronoun condition in both Transition conditions, then it is difficult to say that there is a division of labor between null and overt pronouns in Japanese.

The other question concerns the Continue condition: What caused the (significant) RT difference between the Overt-Pronoun and the Repeated-Name conditions here? Shoji et al. do not discuss the OPP in regard to this comparison.²³ Recall that these two RE conditions had the same number of characters and moras, so the longer RT in the Overt-Pronoun condition cannot be explained in terms of sentence-length differences. Shoji et al. might say that this second type of the OPP occurred because overt pronouns carry more information than repeated names do, but there is no evidence that this is the case. Nevertheless, the RT difference clearly points to the peculiarity of the Japanese overt pronoun: Although a pronoun is considered more reduced than a (repeated) name, it elicits a longer RT (indicating a greater processing cost) than a repeated-name subject does when the referent is an accessible entity.

2.2.4 Summary

This section reviewed some online and offline comprehension experiments that investigated whether there is a “division of labor” between null and overt subject pronouns in Italian, Spanish, Chinese, and Japanese discourses. Following the finding that explicitness of RE form is inversely correlated with accessibility of discourse entities, we predicted that null pronouns—the most reduced RE form—should be preferred over overt subject pronouns when the antecedent encodes a highly salient discourse entity. Although the Japanese results from Shoji et al. (2017) are not so clear due to the absence of residual RT analyses, the results from Italian and Spanish indicate that in the Continue condition (i.e., subject as antecedent), sentences with a null-pronoun subject were processed faster than those with an overt-pronoun subject. Interestingly, Yang et al. (1999) found no RT difference for Chinese between sentences with null- vs. overt-pronoun subjects when two gender-mismatching entities were in the discourse; these two types of pronouns in this language seem to be equally appropriate for an accessible entity in this discourse context. Overall, the results supported the prediction that null pronoun subjects are preferentially used when the antecedent refers to a highly accessible entity (i.e., in subject position). As for overt pronoun subjects, Italian speakers disprefer them when the

²³ They do say that the OPP in the comparison of the Null- and Overt-Pronoun conditions—in both Transition conditions—comes from the superfluous information on the overt pronoun.

antecedent is the subject, whereas Chinese speakers use them with both subject and object antecedents. Spanish speakers and Japanese speakers did not show a clear antecedent preference with overt pronoun subjects in the types of discourses used in the studies.

Although Filiaci et al. (2014) tested Italian and Spanish speakers on the Italian and Spanish versions of the same reading stimuli, there is no study that directly compared processing by English, Chinese, and Japanese speakers. Also, Shoji et al. (2017) did not use residual RTs in their Japanese experiment and so we cannot know what the short raw RT in the Null-Pronoun condition actually means. The present study will test English, Chinese, and Japanese speakers using the same stimuli translated into the three languages and use residual RTs in the analysis to better understand how pronominal and repeated-name subjects are processed in these languages.

2.3 RE-form preferences in comprehension vs. production

So far we have discussed RE use in discourse based on three fundamental assumptions: (i) RE form is essentially inversely correlated with accessibility of the referents in discourse, (ii) the speaker and the hearer build more or less the same discourse representations during communication so that (iii) the speaker can help the hearer's referent identification process by providing a more appropriate RE as a search guide. Assumption (i) has been attested in numerous studies; overt pronoun subjects in English and null pronoun subjects in null-subject languages are preferred over a more explicit RE when the referent is encoded by the subject or first NP in the preceding clause/sentence. However, some studies have questioned assumptions (ii) and (iii). Here we will discuss a study that argued that in some cases, the accessibility of entities in the speaker's representations becomes lower than their accessibility in the hearer's representation, and so the speaker tends to produce repeated names even when referring to an entity denoted by the subject of the preceding sentence.

Arnold and Griffin (2007) tested native English speakers in a story-telling task to find out whether choice of subject-RE forms (a pronoun or a repeated name) differs between contexts with and without a competitor. In the task, participants were first asked to view a picture ("Picture 1") on a computer screen and repeat the aurally presented sentence that described the context. Then another picture ("Picture 2") was added below Picture 1, and participants talked about the event depicted in Picture 2 on their own. Table 2.2 exemplifies the test conditions, the

kinds of entities depicted in Picture 1 and Picture 2, and a sample sentence presented with Picture 1.

Table 2.2. Test conditions and a sample item in Arnold and Griffin (2007)²⁴

Condition	Picture 1	Picture 2	Sentence presented with Picture 1
One Entity	MICKEY	MICKEY	<i>Mickey went for a walk in the hills one day.</i>
Two Entities	MICKEY & DAISY	MICKEY & DAISY	<i>Mickey went for a walk with Daisy in the hills one day.</i>
Two→One Entities	MICKEY & DAISY	MICKEY	<i>Mickey went for a walk with Daisy in the hills one day.</i>

The *One-Entity condition* had only one entity (e.g., MICKEY) in the discourse. The *Two-Entity condition* had a male entity and a female entity in the discourse. The sentence provided with Picture 1 referred to one entity (e.g., MICKEY) encoded in subject position and the other (e.g., DAISY) encoded in prepositional-object position, and this second NP served as the competitor; these two entities were depicted in both pictures. The *Two→One-Entity condition* also had a male entity and a female entity in Picture 1, but Picture 2 depicted only the entity encoded as the subject in the sentence accompanying Picture 1. The experiments used four Disney characters that most participants were very familiar with (MICKEY MOUSE, MINNIE MOUSE, DONALD DUCK, and DAISY DUCK), and the female characters in the pictures had a big bow and long eyelashes so that participants could easily recognize their gender. Arnold and Griffin conducted two experiments; Experiment 1 compared subject-RE production in the One-Entity and Two-Entity conditions only, and Experiment 2 compared subject-RE production in all three conditions.

Arnold and Griffin were interested in whether participants produce a pronominal subject or a repeated-name subject when describing the event depicted in Picture 2 (e.g., “**Mickey/He** got tired an hour later and sat down on the ground”). Traditional accounts like Ariel (1990) and Gundel et al. (1993) would predict approximately equal proportions of pronouns across the three conditions. However, the results did not show such patterns. In Experiment 1, participants

²⁴ The One-Entity, Two-Entity, and Two→One-Entity conditions are called, respectively, the *single-character*, *two-character*, and *two/one-character contexts* in Arnold and Griffin (2007).

produced more pronominal subjects in the One-Entity condition (around 65%) than in the Two-Entity condition (around 20%). The difference in the proportions must be due to the presence of the competitor—in the visual context of both pictures and in the linguistic context of Picture 1)—in the Two-Entity condition. In Experiment 2, participants again produced more pronominal subjects in the One-Entity condition (67%) than in the Two-Entity condition (29%), but the proportion of pronouns in the Two→One-Entity condition (33%) did not significantly differ from that in the Two-Entity condition. The sole difference in the materials between these two conditions was whether or not Picture 2 had an image of the competitor entity. The results can therefore be interpreted as follows: The visual (un)availability of the competitor in Picture 2 does not influence the speakers' choice of subject-RE form. The findings from the two experiments together suggest that the locus of the differences in the choice of subject-RE form is the presence/absence of the competitor in (the representation of) the discourse itself.

But why did the participants produce fewer pronouns, or more repeated names, when a competitor was present in the discourse? One might say that when there was a second entity, participants wanted to clearly distinguish it from the main entity by using their names. However, the two entities always differed in terms of gender; so to avoid ambiguity, participants could have simply used the 3sg pronouns. Why didn't they do this? Arnold and Griffin argued that the frequent use of repeated names occurred because the two discourse entities competed for the participants' attention. Arnold (2010) conjectures:

Discourse properties can either boost or dampen a representation, for example increasing activation if the referent occurs in subject position. The next time the speaker refers to this entity, a pronoun is acceptable only if the activation passes a particular threshold. If cognitive tasks compete for available resources [...], processing load will decrease available resources for maintaining activation, and thus increase the use of explicit forms. (pp. 196–197)

On the assumption that attention is a limited resource (e.g., Baddeley, 1986), the amount of attentional resources allocated to the main entity decreases when attentional resources are also allocated to the second entity. The reduced attention to the main entity leads to the reduced accessibility of that entity, and this reduced accessibility—now presumably lower than a

particular “threshold”—encourages participants to produce a more explicit RE. This interpretation is also consistent with the results from the latency analysis, which measured the time gap between the presentation of Picture 2 on the computer screen and the onset of participants’ utterances. If participants experienced competition, they should have needed more time for utterance preparation. As predicted, the mean latency in the One-Entity condition (1499 ms) was shorter than the mean latencies in the Two-entity condition (1678 ms) and in the Two→one-entity condition (1661 ms).

Arnold and Griffin also claim that the competition for attentional resources is a speaker-internal constraint on RE production. If the speaker had intended to help the hearer identify an entity, he/she would have used a pronominal subject because the hearer prefers a pronominal subject when the antecedent is a subject (Gordon et al., 1993), and also because the use of a repeated-name subject does not have much communicative advantage when a (gender-marked) pronoun suffices to clearly distinguish the two entities. Thus, in contrast to the assumptions of traditional accounts of RE use (see above), namely, that the speaker considers the discourse accessibility in the hearer’s representations (e.g., Ariel, 1990; Givón, 1983), the speaker sometimes relies on the discourse accessibility in his/her own representations (see also Fukumura & van Gompel, 2012).

A remaining question is why participants frequently produced repeated-name subjects in this study but English-speaking participants in online reading studies prefer a pronoun when the antecedent is a subject. The discourses used in Gordon et al. (1993) and the ones used in Arnold and Griffin (2007) both have two protagonists, so the competition for attentional resources should have occurred in both studies. The authors do not touch on this issue, but it may be that the story-telling task they employed levied more processing burden on participants than the online reading experiments did. Participants were asked to look at Picture 1 while hearing a sentence describing the context, figure out what the characters are doing in Picture 2, and then plan and produce a message describing the event. The participants needed to process the non-linguistic visual information and the linguistic information at the same time, so they might have experienced greater processing burden than in a simple sentence comprehension task. The combination of competition for attentional resources and the integration of different types of information may have greatly reduced the accessibility of the discourse entities.

In sum, Arnold and Griffin (2007) showed that even in a context where a pronoun suffices for the purpose of referent identification, the speaker frequently uses a repeated-name subject to refer to the main entity when another entity is present in the discourse. They argue that this is due to competition for attentional resources among the entities; the attention allocated to the main entity is reduced when a second entity also requires attention from the speaker, and the reduced attention/accessibility to that entity encourages the speaker to produce an explicit subject-RE. It was speculated that the same relationship between RE form and discourse accessibility underlies comprehension and production tasks, but cognitively “heavy” (production) tasks, in comparison to cognitively “light” (comprehension) tasks, greatly lower the accessibility of discourse entities. This could be why the speakers in Arnold and Griffin (2007) were more likely than readers in online reading studies to prefer repeated-name subjects when referring to the main entity.

2.4 Research questions and motivation for Experiments 1 and 2

In the next two chapters, we will report an online reading study and a picture-narration study that we conducted to examine the comprehension and production of REs by native speakers of English, Chinese, and Japanese. Experiment 1 uses a sentence-by-sentence self-paced reading task similar to the ones used in Gordon et al. (1993) and Yang et al. (1999). Previous studies have investigated the processing of REs in various languages, but in most cases, they used different stimuli and different data-analysis methods (e.g., the use of raw RTs or residual RTs; comparisons of RTs between RE conditions or between Transition conditions). This makes it difficult for us to see more precisely the similarities and differences in the processing patterns. To overcome this problem, we created a set of reading stimuli in English, which were then very carefully translated into, first, Japanese, and—with the help of native Mandarin speaker who is getting his PhD in Japanese linguistics—Chinese. Also, we will analyze residual RTs because sentences with a null-pronoun subject are always shorter than sentences with an overt-pronoun or repeated-name subject. A shorter RT elicited in the Null-pronoun condition than the other conditions could mean either a facilitation of RE processing or no facilitation of RE processing, so effects of sentence-length differences need to be excluded from RTs.

If the previous findings can be replicated with our new materials, then we expect to see (i) the RNP in English and Chinese and (ii) the OPP and the RNP in Japanese. The OPP should be missing in the Chinese data because null and overt subject pronouns in this language seem to be equally preferred when the antecedent is in subject position. On the other hand, the OPP should be observed in Japanese because overt pronouns in this language are marked forms whose occurrences in discourse are constrained by various historical and socio-cultural factors. It will be interesting to examine presence/absence of the OPP in the data of these two typologically similar (null-subject) languages. Further details about the reading task will be presented in Chapter 3.

Experiment 2 looks at the production of subject-REs in discourse using a picture-narration task similar to the one in Arnold and Griffin (2007). Arnold and Griffin found a greater proportion of repeated-name subjects produced for the main entity in contexts with a competitor than in contexts without a competitor. Since the competition for attentional resources among discourse entities is not dependent on a particular linguistic property, the same effect should be observed in Chinese and Japanese. When there is only one entity in the discourse, the predominant subject-RE form should be (overt) pronouns for English speakers and null pronouns for Chinese and Japanese speakers. But given the findings in Yang et al. (1999) and from discourse analyses (e.g., Li & Thompson, 1979; Tai, 1978), Chinese speakers may use not only null-pronoun subjects but also overt-pronoun subjects. In contexts with two entities (either in the Two-Entity condition or in the Two→One-Entity condition), participants should prefer a more explicit form of REs: English speakers and Japanese speakers should produce repeated-name subjects more frequently than in the One-Entity condition, and Chinese speakers should produce overt-pronoun subjects (more explicit than null-pronoun subjects) and repeated-name subjects more frequently than in the One-Entity condition.

In an effort to obtain corroborating evidence that the reduced accessibility of an entity increases the use of more explicit subject-RE forms, we created four more conditions: Two-entity and Two→One-Entity Continue conditions with gender-matching entities (e.g., MICKEY and DONALD) and Two-Entity and Two→One-Entity Shift conditions with gender-mismatching entities (e.g., MICKEY and DAISY). We predict that when the competitor and the main entity match in gender, the accessibility of the main entity will decrease and, accordingly, the use of repeated names will increase. We also predict that when participants are

forced to refer to a competitor, which is assumed to be lower in accessibility than the main entity (subject as antecedent), they will predominantly use repeated names. Chapter 4 will detail the experimental design and results.

CHAPTER 3

EXPERIMENT 1: ONLINE COMPREHENSION OF REFERENTIAL EXPRESSIONS BY NATIVE SPEAKERS

3.1 Introduction

Experiment 1 examines native speakers' online comprehension of referential expressions (REs) in discourse by using sentence-by-sentence self-paced reading tasks. Experiment 1A will look at whether the Repeated Name Penalty (RNP) found in Gordon et al. (1993) can be replicated with the materials developed for the present study. Native English speakers read three-sentence passages like (18a-b-c) and (18a-b'-c).

- (18) a. Jane woke up Tom at 9 am this morning.
Continue b. **She/Jane** took off the blanket and said, "Wake up!"
Shift b'. **He/Tom** looked at the alarm and jumped out of bed.
 c. Classes start at 9:30 am.

The passages are similar to the ones used in Gordon et al., but the number of context sentences was reduced to one in order to minimize the processing burden on the L2ers of English to be tested in later experiments (Experiments 3A and 3B). The critical sentence (18b/b') was manipulated in terms of two factors: *Subject-RE type* (Pronoun vs. Repeated Name) and *Transition* (Continue vs. Shift). In the Continue condition, participants are predicted to process sentences with a pronominal subject faster than those with a repeated-name subject (i.e., the RNP) because a reduced form should be preferred when a subject-RE refers to a continued discourse center (e.g., the center JANE in [18a] continues to be the center in [18b]). By contrast, a shifted discourse center (e.g., the center JANE in [18a] is shifted to TOM in [18b']) is assumed to be less accessible than a continued center, so a preference for a pronominal subject should be weakened or disappear in the Shift condition.

In addition to these passages with two entities, passages with only one discourse entity are also tested. Previous studies used passages with two entities to see how different degrees of accessibility in discourse entities influence RE-form preferences, but representing two entities in the mind is more costly than representing only one, because, according to Arnold and Griffin

(2007), two entities compete for attentional resources. Thus, when there is only one human protagonist in the discourse, this entity should be extremely accessible and so a pronominal subject should be clearly preferred. A sample item from the one-entity context is given in (19).

- (19) a. Grace was in an ocean-view restaurant.
b. **She/Grace** had a very delicious steak there.
c. It was a fancy dinner.

Experiments 1B and 1C test the processing of subject-REs in, respectively, Chinese and Japanese. The stimuli used in the English experiment were carefully translated into Chinese and Japanese, but some new items were added so that three RE conditions can be examined: the *Null-Pronoun*, *Overt-Pronoun*, and *Repeated-Name conditions*. In the Continue condition, both groups of participants are expected to show the RNP (a longer reading time [RT] in the Repeated-Name condition than in the Null-Pronoun condition), but the OPP (a longer RT in the Overt-Pronoun condition than in the Null-Pronoun condition) should be limited to the Japanese group if the findings in Yang et al. (1999) can be replicated.

In Experiment 1, the RTs obtained from participants are first transformed into log RTs so as to meet the assumption in parametric tests that a dependent variable fits a normal distribution. The normality of the data is checked using Q-Q plots. Then the log RTs are converted into residual log RTs to factor out sentence length. Repeated names are generally longer and have more letters or characters than overt pronouns, and these overt forms of REs are longer than null pronouns. As mentioned in the previous chapter, this creates a problem when one compares the raw RTs across RE conditions because a longer RT from a sentence with a relatively longer RE could mean that participants dispreferred the RE form or that they simply needed more time to process it. Also, some of the previous studies analyzed residual RTs but others used raw RTs, so it is hard to compare RE preferences across languages. Thus, the present study looks at the patterns of residual log RTs across RE conditions and also compare them with the patterns of raw log RTs. This way, we can see to what extent the length difference in RE forms influences RT patterns and how RE preferences differ across English, Chinese, and Japanese.

In an actual experiment session, participants first completed a production task (Experiment 2), a fill-in-the-blank task (see Materials below), and then this self-paced reading

task. The reason for this order was to prevent the reading task from affecting performance on the production task. And although the reading task followed the production task, it will be discussed as Experiment 1 because participants' RE-form preferences in (cognitively less costly) comprehension are assumed to be the default and serve as the baseline for a comparison with RE preferences in (cognitively more costly) production (see Chapter 2).

3.2 Experiment 1A: Native English speakers

3.2.1 Participants

A total of 40 native English speakers participated in the experiment. They were undergraduate and graduate students specializing in various academic subjects at the University of Hawai'i. All participants reported that English is their L1 and dominant language, and none of them started learning an L2 until high school. They received a gift certificate or course credit as compensation for their participation.

3.2.2 Materials

Twenty sets of experimental items like (19) were created. Two human protagonists of different gender were introduced in the context sentence, one by the subject NP and the other by the object NP of a verb or a preposition (e.g., *Tom apologized to Jane*). Throughout the stimuli, the same eight mono-syllabic names were used: *Bob, Mark, Paul, Tom, Ann, Grace, Jane, and Kate*. These names were chosen (i) because they are orthographically and phonologically distinct from each other and so it should be easier for participants to represent the entities distinctively in their mind, and (ii) because the names are commonly used in the United States and so participants, especially L2ers of English (see Chapter 5), should easily be able to identify the intended gender of the referents. For discourses in the two-entity context, the names were put into four pairs of a male name and a female name—*Bob and Kate, Mark and Ann, Paul and Grace, and Tom and Jane*—and each pair was used together in a passage. The goal of this manipulation was to avoid the processing cost necessary to represent discourse with various pairs of entities. The gender of the entities was counterbalanced between subject and object positions. Twenty verbs that are frequently used and expected to be familiar to L2ers were included in the context sentence: *apologize, ask, call, email, give, hand, hit, interview, mail, pay, push, rescue,*

sell, teach, tease, throw, wait, wake, write, and yell. They were always presented in the past-tense form.

The coherence relation between the context sentence and the critical sentence was controlled. In the sample stimuli from Gordon et al. in (8), repeated here as (20), the critical sentence in the Continue condition (20c) comments on the personality of *GEORGE*, whereas the critical sentence in the Shift condition (20c') denotes an event that occurred after the event in the context sentences.

- (20)
- a. George jumped out from behind a tree and frightened Debbie.
 - b. He was surprised at her hysterical reaction.
 - Continue c. **He/George** never thinks about how others might feel.
 - Shift c'. **She/Debbie** screamed loudly and ran away.
 - d. Practical jokes are not always fun for everyone.

(Gordon et al., 1993, pp. 333–334, [1]–[4'])

In the sample stimuli from Yang et al. (1999) in (16), whose English translation is repeated here as (21), the critical sentence in the Continue condition (21b) explains the reason for the event in the context sentence, whereas the critical sentence in the Shift condition (21b') states the response to or the result of the event denoted in the context sentence.

- (21)
- a. 'Xiaomei (female) told Xiaorong (female) that vegetables, instead of flowers, should be planted in the garden.'
 - Continue b. '(She)/She thought vegetables are of more utility than flowers.'
 - Shift b'. '(She)/She thought, however, that both vegetables and flowers should be planted.'
 - c. 'The usage and planning of a garden are worth studying.'

(Yang et al., 1999, p. 732, Table 6, English translation only)

Although it is not possible to examine what coherence relation was used in the other items in those two studies, at least some of the sentences in the Continue condition elaborated or explained the event/state in the context sentence(s) and at least some of the sentences in the Shift

condition described an event/state that occurred after the event in the context sentence(s) (see Kehler, 2002 for more discussion of coherence relations). Following the tendency found in the sample items, the present study used the elaboration/explanation relations for the Continue condition and the occasion/result relations for the Shift condition.

The last sentence of each passage, the *concluding* sentence, finished the story by making a general statement about the topic of the discourse or by mentioning a subsequent event that happened to both of the entities (e.g., *Jane called Tom. Tom picked up the phone right away and said “Hello?” They chatted for an hour.*). To avoid creating discourse-continuation biases, this sentence *never* used *he/she* nor repeated names that had appeared earlier in the discourse.

In addition to the items for the two-entity context, 10 items were created for the one-entity context. They also used the names in the list above. Basic verbs *be*, *become*, *get*, *go*, and *stop* were used in the context sentence, and the critical sentence denoted an event that occurred after the completion of the event in the context sentence. The concluding sentence concluded the story and *never* had *he/she* nor a repeated name that had appeared earlier in the discourse.

All these experimental items were then normed by four native English speakers who were naïve to the purpose of the experiment. This norming task was conducted to make sure that the RTs for the critical sentence do not increase because of a lack of coherence between the context and critical sentences. The participants were asked to judge how naturally the three sentences flow in each passage. Two stimuli lists were created. The 10 items from the one-entity context were included in both lists, but the 20 items from the two-entity condition were distributed in a Latin-square design in such a way that one list contained 10 items in the Continue condition and 10 in the Shift condition, and the other list contained the same items in the other Transition condition. To maximize the naturalness of sentence flow, a pronominal subject was used for the critical sentences in the Continue condition and a repeated-name subject was used for the critical sentences in the Shift condition.

The two stimuli lists also contained 55 filler items, which also consisted of three sentences.²⁵ The participants indicated their naturalness judgments by using a 4-point Likert scale: 1 *unnatural*, 2 *somewhat unnatural*, 3 *somewhat natural*, and 4 *natural*. When they chose

²⁵ Of the 55 “other” items, 15 were the experimental passages used in the Chinese and Japanese versions of the stimuli. These extra items were necessary so as to create the Null-Pronoun condition ($k = 5$) for the one-entity context, the Two-Entity Continue condition, and the Two-Entity Shift condition.

1 or 2, they were asked to state the reason for the perceived unnaturalness. Based on their feedback, we modified the relevant items (and usually checked again with another native English speaker who did not participate in the norming task).

After the item modification, item lists for the self-paced reading task were created (the experimental sentences are available in Appendix A). The items for the two-entity context were distributed into four lists (2 RE conditions \times 2 Transition conditions) in a Latin-square design. The items for the one-entity context were first distributed into two of the four lists (2 RE conditions only) in a Latin-square design and then these lists of items were duplicated and added to the remaining two item lists. In addition to the 30 experimental items ($k = 5$ per condition), each list also had 24 filler items consisting of three sentences (Appendix A).²⁶ The context sentence of the filler items introduced one or two discourse entities using a proper name from the name list above and/or a full NP (e.g., *the researcher*). Importantly, the critical sentence of the fillers never had a pronoun or a repeated name in subject position; instead, an NP that was new to the discourse or the expletive *there* was used to avoid making discourse-transition biases.

A comprehension question was created for each item. The questions asked either about the content of the critical/second sentence in the experimental and filler items (40%) or about the content of the context/first sentence or the concluding/third sentence. Among the questions that probed the content of the critical/second sentence, 60% asked about the agent or patient of the described action (e.g., *Who jumped out of bed?* for the passage in [18]) and the rest asked about other types of information within the sentence.

In the stimuli lists, the order of the experimental items for the two-entity context was randomized, and at least one one-entity-context item or one filler item was inserted between two two-entity-context items, again to avoid making discourse-transition biases (i.e., a priming effect from the transition relation used in a preceding passage). Lastly, another set of four item lists (Lists 5 to 8) was created by reversing the item order in the original item lists (Lists 1 to 4) in order to check a potential effect of item order on the RTs.

Before the reading experiment, participants completed a written C-test (Appendix B), a proficiency measure, adopted from Schulz (2006). It consists of three short texts; 20 words in

²⁶ The number of filler items in psycholinguistic studies is usually more than double the number of experimental items. However, because each item in this study consisted of three sentences, and because L2ers of English at low-intermediate to advanced proficiency levels would be reading the same stimuli in Experiment 3, the number of fillers was limited to the 80% of the experiment items (i.e., $30 \times 0.8 = 24$ fillers).

each text were replaced with blanks except for the first few letters (e.g., *reflection* → refle[]). Participants were asked to fill in the blanks using the contextual information and their knowledge of English. The C-test scores served as the baseline for a comparison with L2 participants in Experiment 3 and as a predictor of the RTs in the statistical analysis (see below).

3.2.3 Procedure

Participants were tested in a sound-attenuated booth in a lab at the University of Hawai‘i. They were seated in front of a 13-inch computer running E-Prime 2.0. Before the main reading task, participants went over the instructions with the author and completed five practice trials. They were asked to read the passages as fast as possible, but not too fast because they needed to answer a comprehension question after each passage. Each trial started with a fixation cross appearing on the left-hand side of the screen. When participants pressed the space bar on the keyboard, the fixation cross was replaced by the context sentence of a passage. When they pressed the space bar again, the sentence was replaced by a fixation cross. A subsequent press of the space bar replaced the fixation cross with the critical sentence of the passage. Participants repeated this process until the concluding sentence.

After reading the concluding sentence, a comprehension question was provided in the center of the screen with two answer options below the question. Half of the questions were *yes/no* questions and the other half were forced-choice questions (e.g., “Jane” or “Tom”). The correct answer options were counterbalanced between the left and right sides. Participants pressed the “D” key to choose the answer option presented on the left side of the screen and the “K” key for the one presented on the right. When they pressed one of the keys to answer the question, the text feedback “Good!” presented itself in the center of the screen, regardless of whether they chose the correct answer. This text was used to signal the end of a trial. After 500 ms, the feedback was automatically removed from the screen and the fixation cross for the next trial was presented. The C-test and the self-paced reading task together took about 25 minutes to complete.

3.2.4 Preparation for data analysis

Only the RT data for the critical/second sentence of the experimental and filler items were analyzed. The RTs for the context/first and concluding/third sentences were excluded

because they were likely to include noise from opening and wrapping up a discourse. The RTs from the critical/second sentences underwent several steps of data trimming and conversion before they were statistically analyzed. Both the preparation for the statistical analysis and the statistical analysis itself were conducted with the computer software R (R Core Team, 2017).

Step 1 of the preparation was to exclude participants and items that had 50% or lower accuracy on the comprehension questions. Since the lowest accuracy was 85% among the participants and 84% among the items in this experiment, no participant or item was excluded. Step 2 was to exclude trials whose comprehension questions were answered incorrectly. This process excluded 4.4% of the data. For Step 3, RTs that were either shorter than 500 ms or longer than 3 standard deviations above the mean across all RTs were excluded as outliers. This process removed 2.0% of the data. Step 4 converted the raw RTs into log RTs. Step 5 was to replace RTs beyond each participant's mean plus or minus 2.5 standard deviations with the cutoff value, although no outlier was found at this step.

Step 6 was to convert the log RTs (of the second sentence in the critical and filler items) into residual log RTs. First, the `lm()` function available in the `lme4` package was used to see if sentence length was a significant predictor of the distributed RTs. The code in (22) was used for this purpose.

```
(22) lm(logRT ~ length.centered, data)
```

The predictor *length.centered* ('centered' sentence length) was obtained for each sentence/trial by subtracting the mean of the numbers of letters in all sentences from the number of letters in each sentence. The centered lengths with a mean of 0 were further scaled to fit within one unit, approximately from -0.5 to 0.5 , by dividing each length by the difference between the longest and shortest lengths in the data set. The linear regression model indicated that sentence length was a significant predictor of the RTs ($b = 0.76$, $t = 18.86$, $p < 0.01$).

Next, the `lmList()` function was used as in (23) to calculate the intercept and the slope for a model fitted to each participant's RTs. The model indicated the predicted RTs.

```
(23) lmList(logRT ~ length.centered | participant, data)
```

Then residual RTs were calculated by subtracting the predicted RTs from the log RTs using `residuals()`. The Q-Q plot in Appendix C shows a straight line, indicating that the data meet the normality assumption well. The plot for checking homoscedasticity in Appendix D reveals about equal variation of residual log RTs above and below 0 (i.e., longer and shorter than the predicted RTs) along the x-axis showing the log RTs of 6.5 to 8, which correspond to about 660 ms to 2980 ms in the original, non-log RTs.

3.2.5 Results

The mean comprehension accuracy before data trimming was 96% for all items, 95% for the experimental items, and 96% for the filler items. This indicates that the participants paid good attention to the task. The participants' C-test scores varied from 35 to 59 out of the maximum score of 60, and the mean and the SD were 47.0 and 6.6, respectively.

Two-entity context

The RTs were analyzed using mixed-effects linear regression and the `lmer()` function in R. The models had (i) (residual) log RTs as the dependent variable, (ii) RE, Transition, and (for English speakers) Proficiency (i.e., C-test scores) as fixed effects, and (iii) Participant and Item as random effects. In addition, since there were two groups of item lists (Lists 1-4 and Lists 5-8), Item List was initially included as a fixed effect. The models did not converge with a four-way interaction of Item List, RE, Transition, and Proficiency, so Proficiency was excluded when the effects of Item List were examined. If these effects were not significant, Item List would be removed from the model and the two groups of item lists would be collapsed for subsequent analyses.

To create deviation coding of the categorical fixed effects, -0.5 was assigned to Lists 1-4 and 0.5 to Lists 5-8 for Item List, -0.5 was assigned to the Pronoun condition and 0.5 to the Repeated-Name condition for RE, and -0.5 was assigned to the Continue condition and 0.5 to the Shift condition for Transition. For Proficiency, the raw C-test scores were first converted into z-scores and then scaled into one unit, approximately -0.5 to 0.5 , and centered so that we can easily see from the regression coefficient how much change in RTs is caused by a one-unit change in Proficiency. When the number of RTs/trials was unbalanced between the two levels of

each factor, the deviation codes and the scaled C-test scores were centered. The maximal model after collapsing the item lists is provided in (24).

(24) $\text{lmer}(\text{residual.log.RT} \sim \text{RE.centered} * \text{Transition.centered} * \text{Proficiency.centered} + (1 + \text{RE.centered} * \text{Transition.centered} | \text{Participant}) + (1 + \text{RE.centered} * \text{Transition.centered} * \text{Proficiency.centered} | \text{Item}), \text{data})$

The first step in the RT analysis used the model above, but it often failed to converge. In this experiment and in Experiment 3 (Chapter 5), when a convergence problem occurred, models with simplified random effects structures were run. Then these models were compared using likelihood ratio tests, and the maximal models justified by model comparison were used in the report of the results. If the model with no slopes for random effects still did not converge, then the fixed effects were simplified, removing one main/interaction term at a time, and the resulting models were then compared using likelihood ratio tests. The p -values were obtained using the `lmerTest` package. An alpha level of .05 was used to determine statistical significance.

The analysis with Item List as a fixed effect did not show a significant main effect ($b = -.011$, $t = -.504$, $p = .615$) or a significant interaction of Item List with RE ($b = .027$, $t = .634$, $p = .526$) or with Transition ($b = .053$, $t = 1.271$, $p = .204$). Thus, the predictor Item List is removed from further analyses. Figures 3.1 and 3.2 show the mean residual log RTs in the Pronoun condition (“Pronoun”) and the Repeated-Name condition (“Name”) for, respectively, the Continue condition and the Shift condition. The zero on the y-axis means that the original, raw log RTs were equal to the predicted log RTs, and positive and negative values signify that the log RTs were, respectively, longer and shorter than the predicted log RTs. The error bars represent 95% confidence intervals calculated with the mean RTs adjusted for repeated measures.

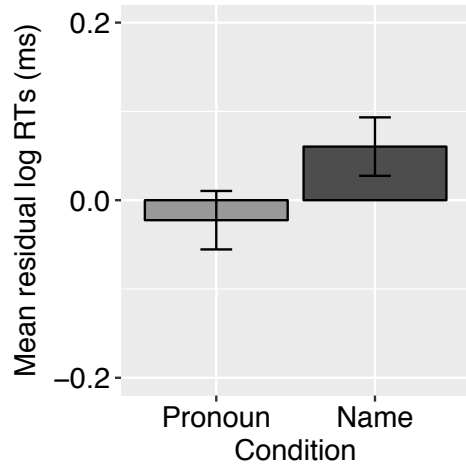


Figure 3.1. Mean residual log RTs for the Continue condition (English natives)

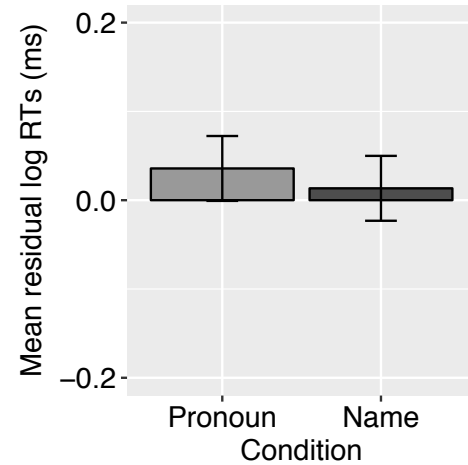


Figure 3.2. Mean residual log RTs for the Shift condition (English natives)

Table 3.1 summarizes the results from the statistical analyses. In the statistics tables and in the figures, “*” indicates a significant effect at the $< .05$ level and “**” at the $< .01$ level.

Table 3.1. Residual RT results for the two-entity context (English natives, with Proficiency)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
RE	.029	.021	1.377	.169
Transition	.003	.021	.154	.878
Proficiency	.007	.039	.174	.862
RE × Transition	−.096	.042	−2.283	.023 *
RE × Proficiency	.016	.078	.209	.834
Transition × Proficiency	−.085	.078	−1.087	.278
RE × Transition × Proficiency	.091	.157	.580	.562

As can be seen in Table 3.1, the only significant effect in the data was the interaction of RE and Transition ($p = .023$). Pairwise comparisons done separately for each Transition condition indicate that the RT difference between the Pronoun and Repeated-Name conditions was marginally significant in the Continue condition ($b = .083$, $t = 1.969$, $p = .063$) but not in the Shift condition ($b = -.016$, $t = -.395$, $p = .696$). These together suggest that the two types of subject-REs were processed differently in the Continue and Shift conditions, and that only in the

Continue condition was there a tendency for sentences with a pronominal subject to be processed faster than those with a repeated-name subject.

The RT analyses above included Proficiency as a predictor because the results will serve as the baseline for a comparison with the RTs in the L2ers of English. However, Proficiency will not be included in the analyses for the native Chinese and Japanese speakers in the next experiments, and so the native English speakers' data were also analyzed without the predictor. The results for the analyses are provided in Table 3.2.

Table 3.2. Residual RT results for the two-entity context (English natives, without Proficiency)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
RE	.029	.021	1.388	.166
Transition	.003	.021	.155	.877
RE × Transition	−.096	.042	−2.285	.023 *

Again, the interaction of RE and Transition was significant ($p = .023$). The RT difference between the two RE conditions in the Continue condition was marginally significant ($b = .082$, $t = 1.950$, $p = .066$) but not significant in the Shift condition ($b = -.018$, $t = -.443$, $p = .662$). Since Proficiency was not a significant predictor in the first analysis (Table 3.1), the removal of the predictor from the model did not yield differences in the RT patterns.

Next, the raw log RTs were analyzed to see whether the residual RT conversion changed the overall RT patterns. Figures 3.3 and 3.4 show the mean RTs in each condition, and Table 3.3 summarizes the statistical results. There was a significant interaction of RE and Transition ($p = .033$). Pairwise comparisons indicate that the effect of RE reached significance in the Continue condition ($b = .112$, $t = 2.488$, $p = .023$) but not in the Shift condition ($b = -.005$, $t = -.107$, $p = .916$). This indicates that the use of residual RTs instead of raw ones did not greatly change the RT patterns.

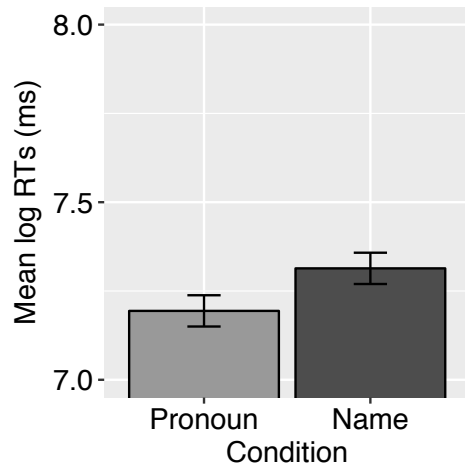


Figure 3.3. Mean log RTs for the Continue condition (English natives)

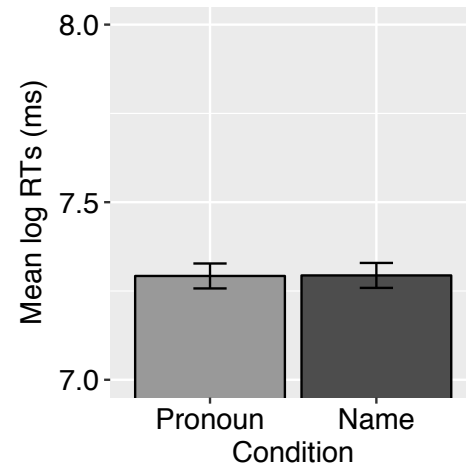


Figure 3.4. Mean log RTs for the Shift condition (English natives)

Table 3.3. Raw RT results for the two-entity context (English natives, with Proficiency)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
RE	.056	.029	1.936	.060
Transition	.039	.026	1.466	.150
Proficiency	−.214	.144	−1.487	.145
RE × Transition	−.114	.051	−2.211	.033 *
RE × Proficiency	< .001	.107	.001	.999
Transition × Proficiency	−.056	.098	−.568	.573
RE × Transition × Proficiency	.076	.192	.394	.696

Overall, the addition of Proficiency as a predictor and the use of residual vs. raw log RTs as a dependent measure did not change statistical significance, and the results indicate that native English speakers processed pronominal subjects faster than repeated-name subjects—and thus preferred pronominal subjects over repeated-name subjects—when the REs were used to refer to a highly accessible discourse entity (the Continue condition). But such a preference was not found when they were used for a less accessible entity (the Shift condition).

One-entity context

The RTs from the passages that had only one entity were also analyzed. Since the antecedent of the subject-REs in the critical/second sentence was always the subject of the context sentence (i.e., no transition of the discourse center), the factor RE was the only fixed effect in the linear regression model. Recall that in the two-entity context (above), sentences with a pronominal subject were read faster than those with a repeated-name subject when the antecedent was a subject (i.e., the Continue condition). Thus, in the one-entity context, sentences with a pronominal subject should likewise be read faster than those with a repeated-name subject.

This is indeed the finding in this context. As can be seen in Figures 3.5 and 3.6, the residual RTs in the Pronoun condition were significantly faster than those in the Repeated-Name condition ($b = .093$, $t = 3.041$, $p = .004$), and the raw RTs also indicate a shorter mean RT for the Pronoun condition than for the Repeated-Name condition ($b = .112$, $t = 3.205$, $p = .004$). These results support the idea that a reduced RE form is preferred over a more explicit form when the referent is a highly accessible discourse entity.

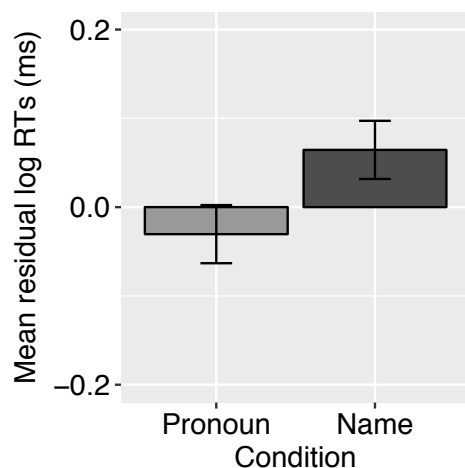


Figure 3.5. Mean residual log RTs for the one-entity context (English natives)

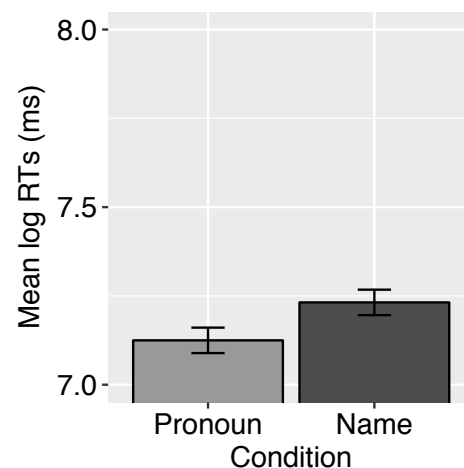


Figure 3.6. Mean log RTs for the one-entity context (English natives)

3.3 Experiment 1B: Native Chinese speakers

This experiment tests native Chinese speakers using the Chinese version of the reading materials. Yang et al. (1999) used materials similar to those used in Gordon et al. (1993) and found that in the Continue condition, Chinese speakers equally preferred null-pronoun and

overt-pronoun subjects; but in the Shift condition, null-pronoun subjects were dispreferred presumably due to lack of a cue for shifting the discourse focus (see Chapter 2). Experiment 1A above replicated the findings in Gordon et al. (1993), so the present experiment is expected to find RT patterns similar to those in Yang et al.

3.3.1 Participants

A total of 52 native Chinese speakers participated in the experiment. They were undergraduate students specializing in mathematics at Sichuan Normal University in China. All participants reported that Mandarin Chinese is their L1 and dominant language. Their English ability was very limited, and none of them had studied Japanese before the experiment. They received 50 yuan as compensation for their participation.

3.3.2 Materials

The English stimuli used in Experiment 1A were first carefully translated into Japanese by the author for Experiment 1C, and then these were translated into Chinese by a native-Chinese research assistant (see below). In addition to the 54 items in the English stimuli, 15 items were created so as to include the condition with a null-pronoun subject. This made the total number of experimental items 30 for the two-entity context ($5 \text{ items} \times 3 \text{ RE conditions} \times 2 \text{ Transition conditions}$) and 15 for the one-entity context ($5 \text{ items} \times 3 \text{ RE conditions}$). Sample items from the two-entity and one-entity contexts are provided in, respectively, (25) and (26).

- (25) a. 徐珍珍 今天 早上 9 点 叫 阿强 起床。
 Xú Zhēn-Zhēn jīn tiān zǎo shang 9 diǎn jiào Ā-Qiáng qǐ chuáng
 Xu Zhen-Zhen today 9 am call A-Qiang woke up
 ‘Xu Zhen-Zhen woke up A-Qiang at 9 am this morning.’
- Continue b. ø/她/徐珍珍 掀开 毛毯, 吼道: “起来了”。
 ø/Ta/Xú Zhēn-Zhēn xiān kāi máo tǎn hǒu dào qǐ lai le
 (She)/She/Xu Zhen-Zhen take off blanket yell “Wake up”
 ‘(She)/She/Xu Zhen-Zhen took off the blanket and said “Wake up!”’
- Shift b'. ø/他/阿强 看了看 闹钟, 从床上 跳了下来。
 ø/Ta/Ā-Qiáng kàn le kàn nào zhōng cóng chuáng shàng tiào le xià lai
 (He)/He/A-Qiang looked at alarm clock from bed jumped down
 ‘(He)/He/A-Qiang looked at the alarm and jumped off the bed.’
- c. 课是 9 点半 开始。
 kè shì 9 diǎn bàn kāi shǐ
 class is 9:30 start
 ‘Classes start at 9:30.’
- (26) a. 张娟 在 海景餐厅 里。
 Zhāng-Juān zài hǎi jǐng cān tīng lǐ
 Zhang-Juan was ocean-view restaurant in
 ‘Zhang-Juan was in an ocean-view restaurant.’
- b. 在那里 ø/她/张娟 吃了 非常美味的 牛排。
 zài nà li ø/tā/Zhāng-Juān chī le fēi cháng měi wèi de niú pái
 there (she)/she/Zhang-Juan had very delicious steak
 ‘(She)/She/Zhang-Juan had a very delicious steak there.’
- c. 那是 一顿 非常奢华的 晚餐。
 nà shì yí dùn fēi cháng shē huá de wǎn cān
 it was a very fancy dinner
 ‘It was a fancy dinner.’

Since the author does not speak Chinese, two native Chinese research assistants were hired for the task of translation. One of them was a graduate student who was getting his PhD in Japanese linguistics at the University of Hawai‘i and was fluent in English and Japanese. He received a set of stimuli written in English and Japanese and translated them into Chinese, ensuring that the meaning of each sentence was maintained. He was also asked to choose eight names that are commonly used in China and clearly signal the gender of the referent. These names replaced the eight names in the English version of the stimuli. For the two-entity context, four pairs of a male name and a female name were created: 阿强 (A-Qiang) and 徐珍珍 (Xu Zhen-Zhen), 阿伟 (A-Wei) and 周莉莉 (Zhou Li-Li), 王大明 (Wan Da-Ming) and 张娟 (Zhang-Juan), and 李小虎 (Li Xiao-Hu) and 刘敏 (Liu-Min). In order to help participants represent the entities distinctly in their mind, one name in each pair had two characters and the other had three characters.

After the translation by the research assistant was completed, the stimuli in Chinese along with the original stimuli in English were given to the second L1-Chinese research assistant, who was fluent in English but neither specializing in linguistics nor aware of the purpose of the experiment. She compared the Chinese translations with the English sentences, and if she felt some parts of the translation sounded unnatural, she suggested a better translation. These suggestions were then brought back to the first research assistant. If he agreed with the second assistant’s suggestions, he modified his translation.

Since extra experimental items were added to the stimuli (because of the need for null-pronoun items), 12 extra filler items were added to the 24 items used in Experiment 1A.²⁷ The 30 two-entity-context items were distributed into six item lists (3 RE conditions \times 2 Transition conditions) in a Latin-square design. At least one one-entity-context item or one filler item was inserted between two two-entity-context items. Then another set of six item lists (Lists 7 to 12) was created by reversing the order of items (in Lists 1 to 6) to check for a potential effect of item order on RTs. The experimental items are available in Appendix A.

Before the self-paced reading task, Chinese participants completed a fill-in-the-blank task created by the author using short texts from e-China Co. Ltd. (n.d.; available in Appendix E). This task was included in order to distract participants’ attention from the RE use in the production task that they had completed before this reading experiment, and also to have participants do a task similar to the C-test conducted in Experiment 1A. However, since the

²⁷ The total number of filler items was equal to 80% of the experimental items ($45 \text{ items} \times 0.8 = 36 \text{ items}$).

fill-in-the-blank task was not used as a proficiency measure, the answer sheets were not marked and Proficiency was not included as a fixed effect in the statistical analysis.

3.3.3 Procedure

Participants were seated in a quiet classroom at Sichuan Normal University. The same experimental procedure in Experiment 1A was used, except that a Chinese-speaking research assistant helped me explain the instructions in Chinese and answer questions from participants. The reading task and the fill-in-the-blank task together took about 30 minutes to complete.

3.3.4 Preparation for data analysis

The RT data were trimmed and converted into residual RTs using the same steps as in Experiment 1A. The lowest comprehension accuracy among the participants was 86% and thus no one was excluded, but one two-entity-context item was excluded due to its low accuracy score (22%). The next step excluded all trials whose comprehension questions were answered incorrectly. The first two steps excluded 5.6% of the data. The RTs that were either shorter than 500 ms or longer than 3 standard deviations above the mean across all RTs were then excluded as extreme outliers, which accounted for 2.3% of the data. The remaining raw RTs were converted into log RTs for normalization purposes. Next, a replacement of the RTs beyond each participant's mean plus or minus 2.5 standard deviations with the cutoff value was applied, but no outliers were found from this analysis.

The effect of sentence length on RTs was examined. Following Experiment 1A, the number of characters in each sentence was used as a variable. The linear model that was calculated with `lm()` indicated that sentence length was indeed a significant predictor of RTs ($b = 1.038$, $t = 23.2$, $p < .001$). Lastly, the log RTs were converted into residual log RTs. The Q-Q plot and the plot for checking homoscedasticity are available in Appendices C and D.

3.3.5 Results

The comprehension accuracy before data trimming was 94% for all items, 93% for the experimental items, and 95% for the filler items. This indicates that the participants attended very well to the task.

As in Experiment 1A, the RT results in the two-entity context will be presented separately from the results in the one-entity context. Also, since three pairwise comparisons (i.e., Null pronoun vs. Overt pronoun, Null Pronoun vs. Repeated Name, and Overt Pronoun vs. Repeated Name) could not be done all at once, three subsets of data were created (e.g., the subset for the comparison of the Null-Pronoun condition and the Overt-Pronoun condition included only the RTs in those two conditions). For deviation coding, the condition with a more reduced RE form was coded with -0.5 and the one with a more explicit RE form was coded with 0.5 . For Transition conditions, -0.5 was assigned to the Continue condition and 0.5 to the Shift condition. Since the numbers of RTs were unbalanced across conditions, all deviation codes were centered.

Two-entity context

The statistical analyses first examined the effects of Item List. The main effect of Item List was not significant in any of the comparisons: $b = -.008$, $t = -.214$, $p = .990$ for the Null-Pronoun vs. Overt-Pronoun conditions; $b = -.010$, $t = -.279$, $p = .778$ for the Null-Pronoun vs. Repeated-Name conditions; and $b = -.005$, $t = -.162$, $p = .845$ for the Overt-Pronoun vs. Repeated-Name conditions. The interactions of Item List with $RE \times Transition$ were not significant, either: $b = -.194$, $t = -1.803$, $p = .076$ for the Null-Pronoun vs. Overt-Pronoun conditions; $b = -.039$, $t = -.340$, $p = .738$ for the Null-Pronoun vs. Repeated-Name conditions; $b = .158$, $t = 1.672$, $p = .097$ for the Overt-Pronoun vs. Repeated-Name conditions. Since Item List was not a significant predictor, it is removed in further analyses.

Figure 3.7 shows the mean residual log RTs from the three RE conditions in the Continue condition, and Figure 3.8 shows them in the Shift condition. Note that although statistical analyses were conducted for pairs of conditions, the figures show the mean RTs of all three RE conditions. This slightly changes the participant means and the grand mean during the calculation of confidence intervals, so the RT difference between two conditions may be significant even if the error bars are overlapping, and, likewise, it may not be significant even if the error bars are not overlapping. Thus, asterisks were added to the figures to indicate significance in the pairwise comparisons of RE conditions.

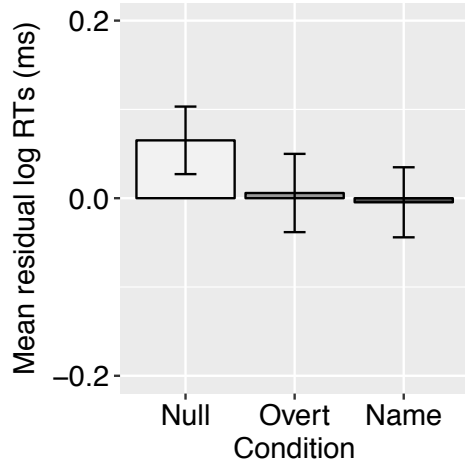


Figure 3.7. Mean residual log RTs for the Continue condition (Chinese natives)

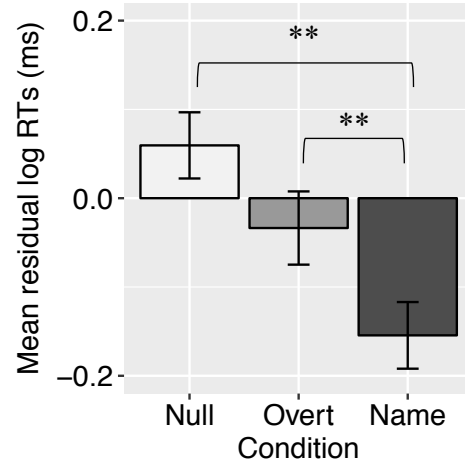


Figure 3.8. Mean residual log RTs for the Shift condition (Chinese natives)

Table 3.4 summarizes the statistical results of the RTs. There was a main effect of RE in the comparison of the Null-Pronoun and Overt-Pronoun conditions. The coefficient suggests that the sentences in the Null-Pronoun condition were read significantly more slowly than those in the Overt-Pronoun conditions. Pairwise comparisons in each Transition condition indicate that the RT difference in the Continue condition was not significant ($b = -.057$, $t = -1.350$, $p = .190$) and it was only marginally significant in the Shift condition ($b = -.088$, $t = -1.922$, $p = .064$). In the comparison of the Null-Pronoun and Repeated-Name conditions, there were significant main effects of RE and Transition as well as an RE \times Transition interaction. Pairwise comparisons showed that although the RT difference was not significant in the Continue condition ($b = -.068$, $t = -1.441$, $p = .161$), it was significant in the Shift condition ($b = -.208$, $t = -4.533$, $p < .001$). In the comparison of the Overt-Pronoun and Repeated-Name conditions, the main effects and the interaction were again all significant. Pairwise comparisons again indicate that the RT difference was not significant in the Continue condition ($b = -.007$, $t = -.189$, $p = .852$) but it was highly significant in the Shift condition ($b = -.122$, $t = -3.765$, $p < .001$).

Table 3.4. Residual RT results for the two-entity context (Chinese natives)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
Null pronoun vs. Overt pronoun				
RE	−.071	.026	−2.764	.006 **
Transition	−.027	.026	−1.047	.295
RE × Transition	−.035	.052	−.685	.493
Null pronoun vs. Repeated name				
RE	−.134	.035	−3.886	.001 **
Transition	−.088	.039	−2.241	.033 *
RE × Transition	−.142	.058	−2.469	.020 *
Overt pronoun vs. Repeated name				
RE	−.065	.023	−2.817	.005 **
Transition	−.100	.041	−2.417	.022 *
RE × Transition	−.116	.052	−2.216	.035 *

These RT patterns are surprising in that they clearly differ from the patterns in Yang et al. (1999), which showed: In the Continue condition, there were shorter RTs in the Null-Pronoun and Overt-Pronoun conditions than in the Repeated-Name condition and in the Shift condition, there was a longer RT in the Null-Pronoun condition than in the Overt-Pronoun condition (and possibly in the Repeated-Name condition). One possible explanation for the differences between the studies is that different sets of stimuli elicited different reading patterns. Since one of the factors that affects Chinese speakers' preferences of null vs. overt pronouns appears to be the breaking of a topic chain caused by a subtle semantic discontinuity (e.g., Li & Thompson, 1979), the null subject pronoun should be preferred only when a story flows very smoothly from the context sentence to the critical sentence. When I asked a native Chinese colleague about potential reasons for the trend toward dispreference of the null pronoun in the Continue condition, his intuition was that if the critical sentence had denoted an event that occurred immediately after the event denoted by the context sentence, then the null pronoun would have

sounded more natural. However, as mentioned above, the critical sentence of the Continue condition in Yang et al.'s sample item explained the reason for the event denoted in the context sentence, rather than describing a subsequent event, so a dispreferred coherence relation should not be the sole reason. Unfortunately, Yang et al.'s reading stimuli are not available and so we are unable to identify how different our stimuli are from theirs.

Another possibility is that the conversion of raw RTs into residual RTs changed the patterns. In the RT conversions above, the number of Chinese characters in each sentence was used as the length of the sentence. The conversion process did not change the overall patterns of non-residual log RTs in the native-English group, but it may have changed the patterns in the native-Chinese group. Indeed, the raw log RT data indicate patterns more similar to the (raw) RT data in Yang et al. Figures 3.9 and 3.10 show the mean RTs in the Continue condition and the Shift condition, respectively. The statistical results are summarized in Table 3.5.

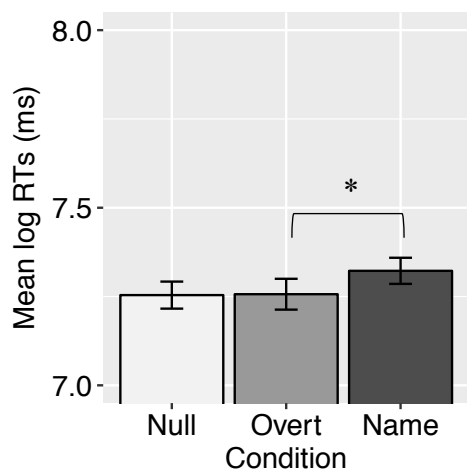


Figure 3.9. Mean log RTs for the Continue condition (Chinese natives)

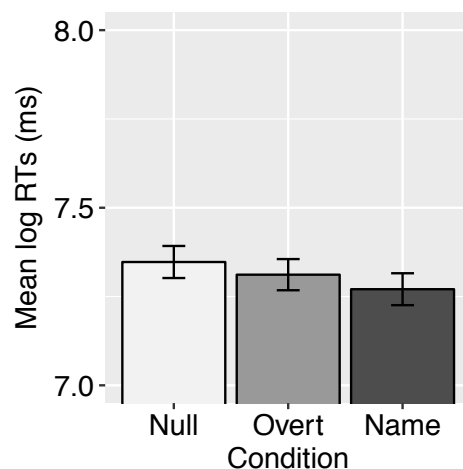


Figure 3.10. Mean log RTs for the Shift condition (Chinese natives)

Table 3.5. Raw RT results for the two-entity context (Chinese natives)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
Null pronoun vs. Overt pronoun				
RE	−.021	.037	−.573	.571
Transition	.087	.056	1.534	.137
RE × Transition	−.039	.053	−.746	.462
Null pronoun vs. Repeated name				
RE	−.002	.036	−.057	.955
Transition	.019	.055	.351	.729
RE × Transition	−.150	.058	−2.575	.016 *
Overt pronoun vs. Repeated name				
RE	.015	.028	.539	.593
Transition	.008	.051	.158	.875
RE × Transition	−.126	.059	−2.154	.041 *

In the comparison of the Null-Pronoun and Overt-Pronoun conditions, there was no main effect or interaction of RE and Transition. Pairwise comparisons in each Transition condition did not find a significant RT difference, either ($b = -.002$, $t = -.042$, $p = .961$ for the Continue condition; $b = -.040$, $t = -.875$, $p = .389$ for the Shift condition). In the comparison of the Null-Pronoun and Repeated-Name conditions, there was an interaction of RE and Transition. The RT difference between the two conditions was not significant in the Continue condition ($b = .069$, $t = 1.59$, $p = .124$) or in the Shift condition ($b = -.075$, $t = -1.511$, $p = .142$), so the significant interaction resulted from the numerically shorter RT for the Null-Pronoun condition in the Continue condition and the numerically shorter RT for the Repeated-Name condition in the Shift condition. There was also a significant interaction of RE and Transition in the comparison of the Overt-Pronoun and Repeated-Name conditions. In the Continue condition, the RTs in the Overt-Pronoun condition were significantly shorter than those in the Repeated-Name

condition ($b = .077, t = 2.092, p = .049$), but the two RE conditions did not yield a significant difference in the Shift condition ($b = -.047, t = -1.337, p = .183$).

Unlike in Yang et al. (1999), the RTs in the Null-Pronoun condition were not significantly longer than those in the Overt-Pronoun conditions when the antecedent was an object (i.e., Shift condition). Still, compared with the patterns in the residual RT data, the patterns in the raw RT data were much more similar to those in Yang et al. Future analyses could seek a measure of sentence length other than the number of characters to see if RT conversion changes the overall RT patterns.

One-entity context

During the comprehension of discourses with one human protagonist, a null-pronoun subject should be processed faster than a repeated-name subject. But, depending on the semantic continuity between two clauses/sentences, an overt-pronoun subject can also be used for an accessible entity; so, an overt-pronoun subject, too, may be processed faster than a repeated-name subject. Figures 3.11 and 3.12 show the patterns for the one-entity context based on the residual RTs and the raw RTs.

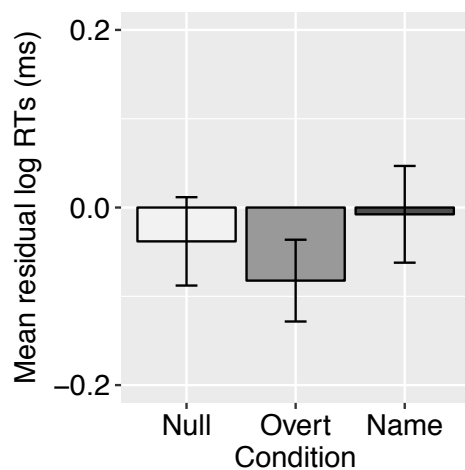


Figure 3.11. Mean residual log RTs for the one-entity context (Chinese natives)

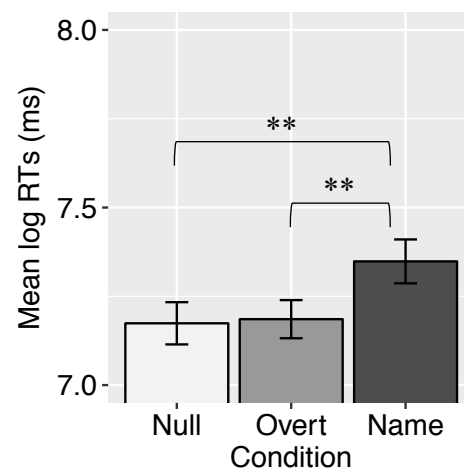


Figure 3.12. Mean log RTs for the one-entity context (Chinese natives)

Table 3.6. Residual RT results for the one-entity context (Chinese natives)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
Residual RTs				
RE (Null Pronoun vs. Overt Pronoun)	−.042	.034	−1.218	.224
RE (Null Pronoun vs. Repeated Name)	.038	.035	1.096	.274
RE (Overt Pronoun vs. Repeated Name)	.081	.042	1.924	.058
Raw RTs				
RE (Null Pronoun vs. Overt Pronoun)	.005	.038	.130	.897
RE (Null Pronoun vs. Repeated Name)	.172	.046	3.716	< .001 **
RE (Overt Pronoun vs. Repeated Name)	.164	.043	3.769	< .001 **

As in the two-entity context, the use of residual RTs greatly changed the patterns in the raw RT data. The numerically shortest residual RT was observed in the Overt-Pronoun condition, and it was almost significantly shorter than the residual RT in the Repeated-Name condition ($p = .058$). On the other hand, the raw RTs in the Null-Pronoun and Overt-Pronoun conditions were both significantly shorter than the raw RTs in the Repeated-Name condition. Overall, the comparison of residual RTs did not clearly show which RE form was preferred, but the comparison of raw RTs did show a clear preference for null-pronoun and overt-pronoun subjects in the one-entity context.

The large differences in the results make it difficult for us to determine RE-form preferences in Chinese. On the one hand, an analysis of residual RTs is important because generally the longer a sentence is, the longer it takes for participants to process it. On the other hand, the most reduced form of REs is expected to be preferred when the referent is highly accessible (e.g., Ariel, 1990), but the residual RTs in the Null-Pronoun condition were the numerically longest in the two-entity context. If one takes this pattern as showing RE preferences in Chinese, then this will require an explanation that allows deviation from the supposedly universal correlation between discourse accessibility and explicitness of RE form. The next section will apply the same RT conversion method to the data from native Japanese speakers. Japanese also uses Chinese characters called *kanji* together with two syllabary systems, *hiragana* and *katakana*. Will method of RT analysis affect the Japanese RT patterns?

3.4 Experiment 1C: Native Japanese speakers

Shoji et al. (2017) claimed that the RTs from their native Japanese participants showed an OPP and an RNP because the interactions of RE and Transition were significant (Null Pronoun vs. Overt Pronoun for the OPP; Null Pronoun vs. Repeated Name for the RNP). This suggests that there was a preference for a null-pronoun subject in the Continue condition, but it became weaker or disappeared in the Shift condition. However, Shoji et al. used raw log RTs in their analysis, and this may be why the mean RT for the Null-Pronoun condition was numerically the shortest in *both* the Continue and Shift conditions; indeed, even in the Shift condition, the RTs in the Null-Pronoun condition were significantly shorter than those in the Overt-Pronoun condition. The RT advantage of the null pronoun is interesting in that it may have occurred because differences in the length of the stimuli were not factored out in the analysis or because overt-pronoun subjects are simply dispreferred due to historical and socio-cultural constraints on the use of this form (e.g., Hinds, 1978—see Chapter 2). As in the previous experiments, the residual RTs and the raw RTs are analyzed.

3.4.1 Participants

A total of 42 native Japanese speakers were recruited as participants for this experiment. They were all students at an English language school in Hawai‘i. They had been living in Hawai‘i for no more than six months at the time of the experiment, and they were placed at the beginning or low-intermediate level of the classes in the school. None of them reported that their best score on the Test of English as a Foreign Language is 500 or higher. They received a \$10 gift certificate as compensation for their participation.

3.4.2 Materials

The Japanese version of the stimuli contained translations of all 54 items in the English stimuli in Experiment 1A and of the additional 15 experimental items and 12 filler items developed so as to include the extra Null-Pronoun condition. A sample item from the two-entity context is provided in (27). All three writing systems in Japanese (*kanji*, *hiragana*, and *katakana*) were used in the stimuli.

- (27) a. 由香さんは 今朝 9 時に 誠君を 起こしました。
Yuka-san-wa kesa 9 zi-ni Makoto-kun-o okosimasita

Yuka-HON-TOP this morning 9 o'clock at Makoto-HON-ACC woke up

‘Yuka woke up Makoto at 9 am this morning.’

- Continue b. ø/彼女は/由香さんは 毛布を めくって
ø/kanozyo-wa/Yuka-san-wa moofu-o mekutte
null/She-TOP/Yuka-HON-TOP blanket-ACC took off

「起きて！」と 言いました。
“Okite!”-to iimasita

“Wake up!”-COMP said

‘ø/She/Yuka took off the blanket and said, “Wake up!”’

- Shift b.’ ø/彼は/誠君は 目覚まし時計を 見て
ø/kare-wa/Makoto-kun-wa mezamasi dokei-o mite
null/He-TOP/Makoto-HON-TOP alarm clock-ACC looked

ベッドから 飛び出しました。
beddo-kara tobidasimasita

bed from jumped out

‘ø/He/Makoto looked at the alarm clock and jumped out of bed.’

- c. 授業は 9 時半に 始まります。
Zyugyoo-wa 9-zi-han-ni hazimarimasu.

class-TOP 9-o'clock-half at start

‘Classes start at 9:30.’

As in the English and Chinese versions of the experiment, eight names that are commonly used in Japan and clearly indicate the gender of the referents were selected and put into four pairs of a male and a female name: 誠 (Makoto) and 由香 (Yuka), 隆 (Takashi) and 理恵 (Rie), 健太 (Kenta) and 舞 (Mai), and 直樹 (Naoki) and 綾 (Aya). In each pair, the two names differed in the number of characters, either one or two. Also, the masculine honorific suffix 君 (–*kun*) was added to the male names and the neutral honorific suffix さん (–*san*) was added to the female names. These

manipulations were used to help participants distinguish the names and the referents in their discourse representations. A sample item from the one-entity context is provided in (28).

- (28) a. 舞さんは 海が 見える レストランに いました。
 Mai-san-wa umi-ga mieru resutoran-ni imasita
 Mai-HON-TOP ocean-nom can see restaurant in was
 ‘Mai was in an ocean-view restaurant.’
- b. そこで ø/彼女は/舞さんは とても 美味しい ステーキを 食べました。
 sokode ø/kanozyo-wa/Mai-san-wa totemo oisii suteeki-o tabemasita.
 there ø/she-TOP/Mai-HON-TOP very delicious steak-ACC ate
 ‘There (she)/she/Mai had a very delicious steak.’
- c. それは 贅沢な ディナーでした。
 sore-wa zeitaku-na dinaa-desita
 it-TOP fancy dinner was
 ‘It was a fancy dinner.’

The subject NP of the context sentence always had the topic marker *-wa*, which is used for an NP whose referent has already been introduced into the discourse and is the current topic of the discourse. One may wonder about the appropriateness of using the topic marker in the first sentence of a passage. However, the same names were repeated throughout the reading experiment; so (except for a few passages at the beginning), when participants encountered a particular name in a passage, they probably assumed that the discourse entity mentioned in previous passages was being referred to again. If the nominative marker *-ga* has been used instead of *-wa*, participants would have had to establish a new entity with the same name and this could have complicated their comprehension process.

The experiment items for the two-entity context and for the one-entity context were normed by four native speakers of Japanese who did not participate in the reading task. The materials and procedure of this task were the same as those in the norming task for Experiment 1A, except that a null-pronoun subject was used instead of an overt-pronoun subject for the critical sentences in the two-entity Continue condition. The English version of the

norming task mentioned in Experiment 1A and the Japanese version of the task were conducted around the same time, so the stimuli were modified based on the suggestions from the four English-speaking participants and the four Japanese-speaking participants.²⁸ The experimental items in the two-entity context were distributed across six item lists, and at least one one-entity-context item or one filler was inserted between two two-entity-context items. Another set of six item lists was created by reversing the item order in the original lists. The experimental items are available in Appendix A.

Before doing the self-paced reading task, the participants completed a fill-in-the-blank task composed of two short texts from Wikipedia.org (Appendix F). This was included to distract their attention from the use of REs in the production task completed earlier in the experimental session and also to have them, like the native Chinese speakers, do a task similar to the C-test that native English speakers did in Experiment 1A. As in Experiment 1B with native Chinese speakers, the fill-in-the-blank task was not used as a proficiency measure; so, the participants' answer sheets were not marked and their scores were not included in the statistical analyses (as the Proficiency predictor).

3.4.3 Procedure

Participants were seated in a quiet classroom at the English school they were attending at the time of the experiment. The same procedure as in the previous experiments was used except that the author explained the instructions and answered questions from participants in Japanese to make sure that they fully understood the task. The reading experiment and the fill-in-the-blank task together took about 30 minutes.

3.4.4 Preparation for data analysis

The RT data were trimmed and converted into residual RTs following the same steps as in the previous experiments. All participants and all items had over 50% of comprehension accuracy (69% or above), so no RTs were discarded at Step 1. At Step 2, the RTs from trials with incorrect responses were excluded. This accounted for 6.4% of the data. Next, RTs that were

²⁸ To keep the English and Japanese versions of the stimuli as similar as possible, any modification made to an English passage based on feedback from an English-speaking normer was also made to the corresponding passage in the Japanese stimuli, and vice versa. The stimuli after these modifications were given to the Chinese-speaking research assistants for translation into Chinese.

either shorter than 500 ms or longer than 3 standard deviations above the mean across all RTs were excluded as extreme outliers, which accounted for 1.8% of the data. Then the raw linear RTs were converted into the log RTs for normalization purposes. Step 5 was the replacement of outliers beyond each participants' mean plus or minus 2.5 standard deviations with the cutoff value, but no data needed replacement. Next, the effect of sentence length on RTs was examined using the `lm()` function. The results showed that sentence length was a significant predictor of RTs ($b = .767, t = 18.41, p < .001$), so the raw log RTs were converted into residual log RTs using the number of characters in each sentence. The Q-Q plot and the plot for checking homoscedasticity are available in Appendices C and D.

3.4.5 Results

The participants' comprehension accuracy before the RT exclusion at Step 2 was 94% for all items, 93% for the experimental items, and 94% for the fillers. This indicates that the participants paid close attention to the task.

Two-entity context

The RE conditions and the Transition conditions were coded in the same way as in Experiment 1B. First, effects of Item List were examined. There was no significant main effect of Item List in any comparison of RE conditions: $b = -.011, t = -.339, p = .737$ for the Null-Pronoun vs. Overt-Pronoun conditions; $b = -.018, t = -.518, p = .602$ for the Null-Pronoun vs. Repeated-Name conditions; and $b = -.023, t = -.743, p = .463$ for the Overt-Pronoun vs. Repeated-Name conditions. There was no interaction of Item List and $RE \times Transition$, either: $b = .113, t = 1.205, p = .237$ for the Null-Pronoun vs. Overt-Pronoun conditions; $b = .179, t = 1.794, p = .076$ for the Null-Pronoun vs. Repeated-Name conditions; $b = .080, t = .805, p = .425$ for the Overt-Pronoun vs. Repeated-Name conditions. Thus, Item List is removed from further statistical analyses.

Figures 3.13 and 3.14 show the mean residual RTs in, respectively, the Continue condition and the Shift condition.

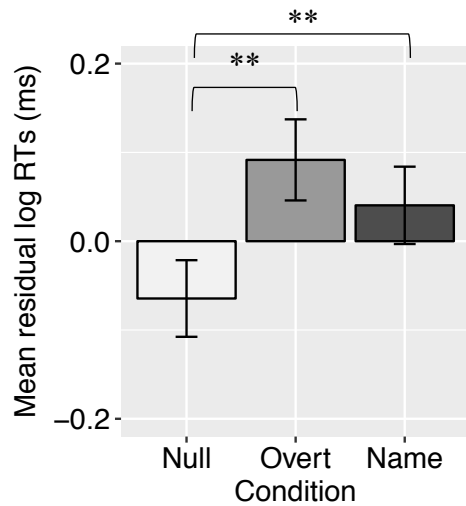


Figure 3.13. Mean residual log RTs for the Continue condition (Japanese natives)

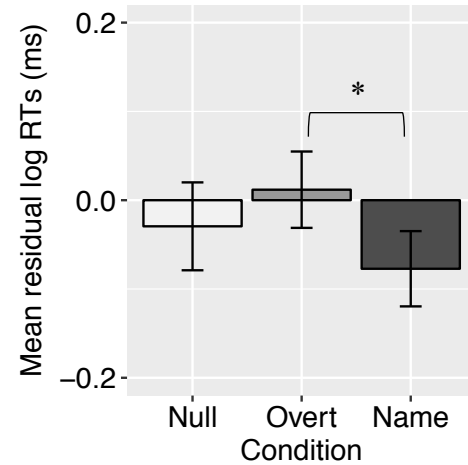


Figure 3.14. Mean residual log RTs for the Shift condition (Japanese natives)

Table 3.7 provides the statistical results.

Table 3.7. Residual RT results for the two-entity context (Japanese natives)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
Null pronoun vs. Overt pronoun				
RE	.103	.035	2.918	.007 **
Transition	-.024	.048	-.492	.626
RE × Transition	-.140	.051	-2.722	.010 *
Null pronoun vs. Repeated name				
RE	.026	.029	.890	.380
Transition	-.033	.040	-.820	.419
RE × Transition	-.171	.062	-2.749	.011 *
Overt pronoun vs. Repeated name				
RE	-.079	.031	-2.523	.018 *
Transition	-.101	.045	-2.247	.031 *
RE × Transition	-.031	.047	-.649	.522

In the comparison of the Null-Pronoun and Overt-Pronoun conditions, there was a significant main effect of RE and an interaction of RE and Transition. Subsequent pairwise comparisons indicated that in the Continue condition, the sentences with a null-pronoun subject were read significantly faster than those with an overt-pronoun subject ($b = .172, t = 3.635, p = .001$), but the RT difference in the Shift condition was not significant ($b = .032, t = .800, p = .417$). In the comparison of the Null-Pronoun and Repeated-Name conditions, there was only a significant interaction of RE and Transition. Pairwise comparisons again showed that in the Continue condition, the sentences with a null-pronoun subject were read significantly faster than those with a repeated-name subject ($b = .110, t = 3.390, p = .001$), but the RT difference in the Shift condition was not significant ($b = -.061, t = -1.293, p = .207$). In the comparison of the Overt-Pronoun and Repeated-Name conditions, there was a significant main effect of both RE and Transition. The RTs in the Shift condition were read faster than those in the Continue condition, which suggests that these overt RE forms facilitated the participants' processing when the antecedents denoted relatively less accessible entities. Pairwise comparisons indicated that the RT difference in the Continue condition was not significant ($b = -.063, t = -1.523, p = .140$), but in the Shift condition, the sentences with an overt-pronoun subject were read significantly more slowly than those with a repeated-name subject ($b = -.094, t = -2.578, p = .016$).

These results suggest that when the antecedent was a subject (i.e., the Continue conditions), a null-pronoun subject was preferred, and the use of overt-pronoun and repeated-name subjects caused processing difficulty (the OPP and RNP). When the antecedent was an object (i.e., the Shift condition), the RT advantage for a null-pronoun subject disappeared, and instead a repeated-name subject elicited the shortest RT. The OPP in both the Continue and Shift conditions supports the prediction that overt pronouns are dispreferred in Japanese regardless of whether the antecedent is a subject or an object. Moreover, the fact that in the Shift condition, the RT in the Null-Pronoun condition was *not* significantly shorter than the RT in the Overt-Pronoun condition suggests that the significantly shorter RT in the Null-Pronoun condition found in Shoji et al. (2017) was because sentence length had not been factored out; it does not necessarily mean that null-pronoun subjects are preferred in both Transition conditions.

Next, the raw log RTs were analyzed. Figures 3.15 and 3.16 show the mean log RTs in the Continue and Shift conditions.

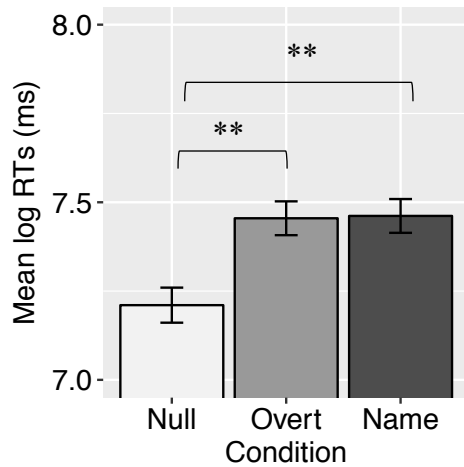


Figure 3.15. Mean log RTs for the Continue condition (Japanese natives)

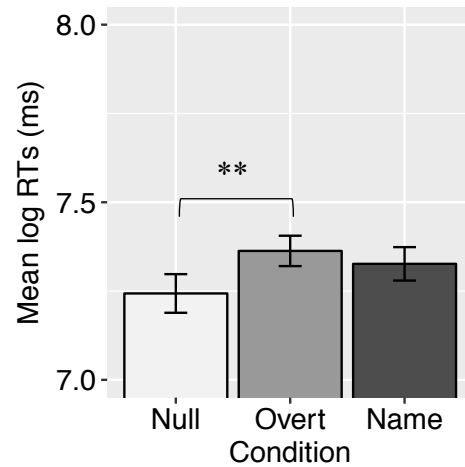


Figure 3.16. Mean log RTs for the Shift condition (Japanese natives)

Table 3.8 summarizes the statistical results. In the comparison of the Null-Pronoun and Overt-Pronoun conditions, a main effect of RE and an interaction of RE and Transition emerged. Pairwise comparisons indicate that the sentences with a null-pronoun subject were read significantly faster than those with an overt-pronoun subject both in the Continue condition ($b = .251, t = 6.424, p < .001$) and in the Shift condition ($b = .110, t = 2.909, p = .004$). The comparison of the Null-Pronoun and the Repeated-Name conditions revealed a main effect of RE and an RE \times Transition interaction; in the Continue condition, the sentences with a null-pronoun subject were read significantly faster than those with a repeated-name subject ($b = .110, t = 2.991, p = .005$), but the RT difference did not reach significance in the Shift condition ($b = .065, t = 1.423, p = .167$). In the comparison of the Overt-Pronoun and Repeated-Name conditions, there was a main effect of Transition. Pairwise comparisons did not find a significant RT difference in the Continue condition ($b = -.008, t = -.181, p = .858$) or in the Shift condition ($b = -.045, t = 1.234, p = .229$).

Table 3.8. Raw RT results for the two-entity context (Japanese natives)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
Null pronoun vs. Overt pronoun				
RE	.183	.034	5.361	< .001 **
Transition	−.032	.052	−.610	.546
RE × Transition	−.151	.055	−2.718	.011 *
Null pronoun vs. Repeated name				
RE	.155	.028	5.517	< .001 **
Transition	−.047	.044	−1.063	.297
RE × Transition	−.185	.063	−2.920	.007 *
Overt pronoun vs. Repeated name				
RE	−.028	.032	−.880	.387
Transition	−.116	.046	−2.512	.018 *
RE × Transition	−.033	.047	−.711	.479

The raw log RTs patterned very similarly to those in Shoji et al. (2017). Like them, the present study found a significant interaction of RE and Transition in the comparison of the Null-Pronoun and Overt-Pronoun conditions as well as in the comparison of Null-Pronoun and Repeated-Name conditions. Also, a significantly shorter RT in the Null-Pronoun condition than in the Overt-Pronoun condition was found in the Shift condition.

When the analyses of residual RTs and raw RTs are compared, a discrepancy emerges in the Shift condition: The residual RTs indicate that a repeated-name subject is preferred over an overt-pronoun subject, but the raw RTs indicate that a null-pronoun subject is preferred over an overt-pronoun subject. It is difficult to determine which form in Japanese is preferred when a referent's discourse accessibility decreases, but nevertheless, what is clear in the data is that in both analyses, an overt-pronoun subject was *never* preferred over the other forms of subject-REs.

One-entity context

Figures 3.17 and 3.18 show the RT patterns for the one-entity context from, respectively, the residual RT analysis and the raw RT analysis. Table 3.9 summarizes the statistical results.

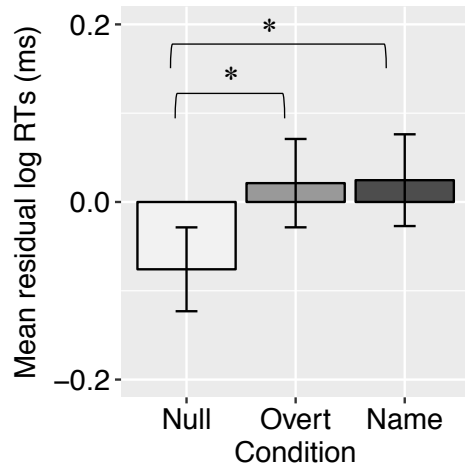


Figure 3.17. Mean residual log RTs for the one-entity context (Japanese natives)

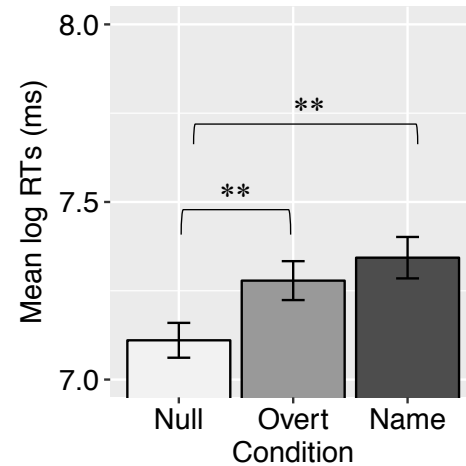


Figure 3.18. Mean log RTs for the one-entity context (Japanese natives)

Table 3.9. Residual RT results for the one-entity context (Japanese natives)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
Residual RTs				
RE (Null Pronoun vs. Overt Pronoun)	.109	.036	3.052	.002 *
RE (Null Pronoun vs. Repeated Name)	.090	.036	2.503	.013 *
RE (Overt Pronoun vs. Repeated Name)	-.013	.035	-.367	.714
Raw RTs				
RE (Null Pronoun vs. Overt Pronoun)	.184	.042	4.361	< .001 **
RE (Null Pronoun vs. Repeated Name)	.225	.045	5.026	< .001 **
RE (Overt Pronoun vs. Repeated Name)	.039	.040	.974	.337

The RT patterns in the one-entity context were similar to those in the two-entity Continue condition: A null-pronoun subject was clearly preferred over overt-pronoun and repeated-name

subjects. The results from the residual and raw RTs nicely converge. Again, the results support the claim that the OPP and the RNP occur in Japanese.

3.5 Discussion

Experiment 1 was conducted to see how native English, Chinese, and Japanese speakers process sentences with a pronominal subject or a repeated-name subject during online reading. Specifically, it was asked whether the OPP (in Japanese only) and the RNP (in all three languages) reported in previous online reading studies can be replicated with new participants and new reading materials. The results in the Continue condition were clear in Experiments 1A and 1C: (i) When the antecedent was the subject NP of the context sentence, English speakers processed a pronominal subject faster than a repeated-name subject,²⁹ which indicates the RNP; (ii) Japanese speakers processed a null-pronoun subject faster than a repeated-name subject, indicating the RNP; (iii) Japanese speakers also processed a null-pronoun subject faster than an overt-pronoun subject, which indicates the OPP. Even with new reading materials, we were able to replicate the RNP in English and the OPP and the RNP in Japanese.

In the Shift condition, there was no RT difference in the English data; in the Japanese data, a repeated-name subject was read faster than an overt-pronoun subject in the residual RT analysis and a null-pronoun subject was read faster than an overt-pronoun subject in the raw RT analysis. Since there was not a significant RT difference between the Null-Pronoun condition and the Repeated-Name condition in either RT analysis, we cannot say that a particular RE form was preferred in the Shift condition. However, both analyses indicate that an overt-pronoun subject was dispreferred.

What was puzzling was the patterns in the Chinese group. Yang et al. found that unlike Italian and Spanish speakers, Chinese speakers process null-pronoun and overt-pronoun subjects equally fast when their antecedent is a subject (i.e., the Continue condition). With our new materials, the raw log RTs resulted in almost equal mean RTs in the Null-Pronoun and Overt-Pronoun conditions but clearly shorter RTs in the Overt-Pronoun condition than in the Repeated-Name condition. In the one-entity condition, the RTs in both the Null-Pronoun and Overt-Pronoun conditions were significantly shorter than the RT in the Repeated-Name

²⁹ Recall that the RT difference was marginally significant ($p = .083$) in the residual RT analysis but reached significance in the raw RT analysis.

condition. Thus, the raw log RTs in the two-entity context showed patterns similar to those in Yang et al. However, the patterns in the residual log RTs were completely different from those in the raw RTs. This was unexpected because the two types of RT analyses did not much change the RE preferences in the English and Japanese groups.

The lack of the RNP in the residual RT analysis of the one-entity context or the Continue condition of the two-entity context seems to be caused by the greatly shortened RTs in the Repeated-Name condition, which were no longer significantly slower than the RTs in the Null-Pronoun condition. To see comparable RT patterns in the two RT analyses, one needs to find a different method of residualization in Chinese. Word frequency could be used as an (additional) RT predictor. Proper names generally have more characters than pronouns, but it seems likely that specific name tokens would also be lower in frequency than the pronoun forms. It might be interesting to see to what extent RT differences can be accounted for by the frequency of the REs. In addition, pronouns and names are, respectively, function words and content words. The length of function words and content words in each sentence could be calculated separately and used as RT predictors.³⁰

The RE preferences in the Chinese group cannot be stated with confidence. But what can nevertheless be suggested is that in Japanese, overt-pronoun subjects are not preferred over either null-pronoun subjects or repeated-name subjects, whereas in Chinese, overt-pronoun subjects are processed similarly to null-pronoun subjects, and raw RTs suggest that they are preferred over repeated-name subjects when the antecedent is a subject.

Throughout this chapter, we treated *tā* in Chinese and *kare/kanozyo* in Japanese as “overt pronouns.” As mentioned in Chapter 2, there is a debate as to whether these forms are in fact overt pronouns equivalent to English pronouns. One might argue that the differences in the RT patterns across the three languages result, at least in part, from differences in the linguistic properties of these REs, rather than from processing preferences. For instance, as Aoun and Hornstein (1991) pointed out, Japanese *kare* can never be construed as a bound variable (e.g., [29]) but Chinese *tā* in, e.g., (30a) can. However, *tā* in (30b) cannot be bound but *he* in the equivalent English sentence can be.

³⁰ My thanks to Amy Schafer for these suggestions (26 May 2017).

(29) Japanese: * Daremo_i-ga [kare_i-ga atamaga ii to] omotteiru.
 everyone-NOM he-NOM be-smart COMP think
 ‘Everyone thinks he is smart.’

(Aoun & Hornstein, 1991, p. 4, [5b])

(30) Chinese: a. Meiren_i shuo Lisi taoyen tā_i.
 ‘No one said Lisi hates him.’
 b. * Meiren_i shuo tā_i yao lai.
 ‘No one said he would come.’

(Aoun & Hornstein, 1991, p. 8, [14b & 15d])

These examples show that even though *kare* and *tā* are conventionally translated as ‘he,’ the ways they behave syntactically are quite different. The present study does not aim to explain what specific grammatical differences could influence speakers’ RE-form preferences, but we should keep in mind that differences in linguistic properties should be considered when exploring cross-linguistic differences in RE-form preferences.

We now turn to cross-linguistic differences in the use of subject-REs in production in Experiment 2.

CHAPTER 4

EXPERIMENT 2: NATIVE PRODUCTION OF REFERENTIAL EXPRESSIONS

4.1 Introduction

Chapter 2 reviewed the story-telling experiment in Arnold and Griffin (2007). Their main finding was that in next-sentence oral continuations, native English speakers have a tendency to produce a pronominal subject when referring to a highly accessible discourse entity like MICKEY following a sentence like *Mickey went for a walk in the hills one day*; but when an additional entity is present in the preceding sentence (e.g., DAISY in *Mickey went for a walk with Daisy in the hills one day*), they were more likely to produce a repeated-name subject for MICKEY. Arnold and Griffin attributed this effect to competition for attentional resources between the two entities; when attention needs to be allocated to both entities in the speaker's discourse representations, the overall activation of each referent decreases and the use of a more explicit RE increases.

Experiment 2 examines native English, Chinese, and Japanese speakers' production of subject-REs in discourse. It uses a task very similar to the one in Arnold and Griffin, although we will call it a "picture-narration task" to be more accurate. In Experiment 2A, native English speakers look at sequences of three pictures and narrate the stories depicted in them. A sample item is given in (31). For the first picture (henceforth "Picture 1"), participants read aloud the description sentence provided with the picture (e.g., *Last weekend, Minnie went hiking [with Donald]*). For the second picture ("Picture 2"), they describe, on their own, the action of a target entity (i.e., MINNIE in [31a-e] and DONALD in [31f-g]) following the provided fragment *And then*. Whether they produce a pronominal subject or a repeated-name subject to refer to the target entity is our interest. Lastly, they describe the third picture ("Picture 3") following a fragment provided (e.g., *A butterfly_____*).

Seven experimental conditions were created. The *One-Entity condition* (31a) introduces a single entity into the discourse; the other six conditions introduce two entities. The conditions with two entities were manipulated in terms of the Number of Entities depicted in Picture 2 (One vs. Two), the Gender of entities (Gender-Matched [GM] vs. Gender-Mismatched [GMM]), and the Transition of the discourse center (Continue vs. Shift). The *Two-Entity conditions* (31b, d, & f) have both discourse entities in Pictures 1 and 2, whereas the *Two→One-Entity conditions* (31c, e, & g) have two entities in Picture 1 but only the target entity in Picture 2.

(31) *Last weekend, Minnie went hiking (with Donald).*

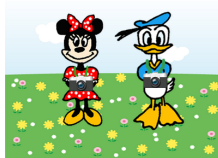
And then, ____.

A butterfly ____.

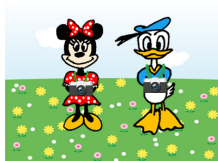
a. One-Entity condition



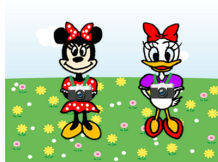
b. Two-Entity Gender-Mismatched (GMM) Continue condition



c. Two→One-Entity GMM Continue condition



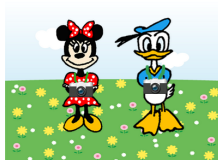
d. Two-Entity Gender-Matched (GM) Continue condition



e. Two→One-Entity GM Continue condition



f. Two-Entity GMM Shift condition



g. Two→One-Entity GMM Shift condition



The *GMM conditions* (31b, c, f, & g) introduce two entities of different gender, and the *GM conditions* (31d & e) introduce two entities of the same gender. The *Continue conditions* (31b, c, d, & e) maintain the discourse center; the entity denoted by the subject NP of the description sentence for Picture 1 (e.g., MINNIE) is depicted again in Picture 2, and participants describe the action of that entity. The *Shift conditions* (31f & g) switch the discourse center; the entity denoted by the object NP (i.e., *the competitor*) of the description sentence (e.g., DONALD) is promoted to the center in Picture 2, and participants describe the action of that entity. In both the Continue and Shift conditions, when Picture 2 depicts two entities (the Two-Entity conditions, [31b, d, & f]), the target entity is depicted as the larger one so that participants know which entity they need to talk about.

The predicted subject-RE production patterns for Picture 2 are as follows. In the One-Entity condition (31a), participants will predominantly produce pronouns to refer to the entity because the sole entity in a discourse should be highly accessible, and hence a reduced RE form should be preferred. In the Two-Entity and Two→One-Entity GMM Continue conditions (31b & c), participants should produce repeated-name subjects more often than in the One-Entity condition because, as suggested by Arnold and Griffin (2007), the presence of a competitor reduces the activation level of the target entity. The proportion of repeated names in these conditions should not differ from each other because in their study, the visual (un)availability of the non-target entity (i.e., the competitor) did not affect subject-RE production.

The predictions for the GM Continue conditions (31d & e) require some grounding. If the competition for attentional resources is the only factor that increases the use of repeated-name subjects, then the GMM conditions (31b & c) and the GM counterparts (31d & e) should elicit about the same proportions of repeated names because they all have two entities. However, Arnold and Griffin (2007) say that gender match/mismatch also influences RE production.³¹ In their pilot experiment reported before their main Experiments 1 and 2, they examined 38 native English speakers' subject-RE production in discourse conditions similar to the Two-Entity GMM and GM Continue conditions (31b & d). The participants produced repeated-name subjects 52% of the time in the GMM condition and 77% of the time in the GM condition, and an ANOVA showed that this difference was statistically significant. Thus, in the present study, the proportion

³¹ This is relevant only in languages that have gender-marked third-person pronouns (e.g., English *he* vs. *she*, but not *they*).

of repeated-name subjects is expected to be higher in the Two-Entity GM condition (31d) than in its GMM counterpart (31b). The proportion of repeated names should be similar, by contrast, between the Two-Entity and Two→One-Entity conditions (i.e., between [31b & c] and between [31d & e]).

The Shift conditions (31f & g) were included in the present study to see whether the accessibility of referents modulated by syntax (subject vs. object) or order of mention (first- vs. second-mentioned NP), in regard to the description sentence accompanying Picture 1, influences subject-RE production. Arnold and Griffin (2007) reported that 16 of the 38 participants in their pilot study saw the Two-Entity GMM and GM Continue conditions and the Two-Entity GMM and GM Shift conditions. They found that the incidence of repeated-name subjects was 47% in the GMM Continue condition, 77% in the GM Continue condition, 83% in the GMM Shift condition, and 100% in the GM Shift condition. An ANOVA indicated main effects of Gender and Transition but no interaction. The main effect of Transition suggests that in both the GMM and GM conditions, participants produced more repeated-name subjects when referring to a competitor (Shift) than when referring to the main entity (Continue). Thus, the GMM Shift conditions in the present study (31f & g) should elicit more repeated-name subjects than their Continue counterparts (31b & c).

Experiments 2B and 2C test, respectively, native Chinese speakers and native Japanese speakers using the same sets of pictures. The description sentences for Picture 1 and the fragments for Pictures 2 and 3 were closely translated into the two languages. Chinese speakers are predicted to produce null-subject pronouns and/or overt-subject pronouns in the One-Entity condition because Yang et al. (1999) and Experiment 1B of the present study found no evidence for a division of labor between the two pronominal forms; by contrast, Japanese speakers are predicted to produce null subjects predominantly and disprefer overt-subject pronouns (based on the results of Experiment 1C). For subject-REs in the conditions with two entities, Chinese speakers should produce overt pronouns (more explicit than null pronouns) and/or repeated names (more explicit than pronouns) when the accessibility of the target entity decreases; Japanese speakers should not produce overt pronouns (again, based on the results of Experiment 1C); they should produce repeated-name subjects frequently when the accessibility of the target entity decreases.

4.2 Experiment 2A: Native English speakers

4.2.1 Participants

The group of native English speakers tested in Experiment 1A ($n = 40$) also participated in this experiment.

4.2.2 Materials

A total of 35 items were created, each of which had the seven conditions shown in (29). Following Arnold and Griffin (2007), four Disney characters (Mickey, Minnie, Donald, and Daisy) were used as discourse entities. Participants were generally familiar with these characters and had no problem identifying their gender. In conditions with two entities, mouse–duck pairs (Mickey, Donald/Daisy; Minnie, Donald/Daisy) were used to make the entities visually and phonologically distinct.

The discourse contexts and the description sentences for Picture 1 were made simpler than those in Arnold and Griffin for the L2ers of English (Experiment 4). The description sentences had a time expression such as *last weekend* and *a few minutes ago* to try to ensure that participants created the representations of past events. For the target entities in Picture 2, events that can be described by simple predicates were selected: *added liquid, bought flowers, bought three muffins, caught a butterfly, changed his/her shoes, cried, cut a birthday cake, danced, drank orange juice, drank water, dropped an egg, fell asleep, found a fish, found a rainbow, found a UFO, got a suntan, got tired, grilled meat, had/ordered spaghetti, jumped into the water, kicked the ball, laughed, listened to music, locked the door, pushed a button, sang a song, studied, took a picture, turned off the TV, washed the dishes, and waved his/her hand*. The description sentences for Picture 1 and the fragments for Picture 3 are available in Appendix G.

The items were distributed into seven item lists in a Latin-square design, which gave five items to each discourse condition. No filler items were created since the author felt that having more than 35 items in this type of task, each prompting three sentences, would be too much for the L2 participants.³² The items were presented in a random order.

³² Arnold and Griffin (2007) had 17 fillers, in addition to 15 items in total for their three experimental conditions ($k = 5$ per condition).

4.2.3 Procedure

The experiment was conducted in the same lab as in Experiment 1A. E-Prime version 2.0 was used to present the stimuli and audio-record participants' utterances. Participants first read the instructions presented on the computer screen and completed five practice trials. The practice items had human protagonists such as children and family members, instead of the Disney characters, to avoid influence from the practice trials on the subject-RE production in the main experiment. Each trial started with a preview of Pictures 1 and 2. The two pictures were presented next to each other on the screen, and participants were asked to create a story in their mind. After three seconds, the pictures automatically disappeared and the text "Please press the space bar when you are ready" appeared. When participants pressed the space bar, Picture 1 was presented on the left side of the screen with a description sentence; the key press also started the audio-recording of participants' utterances. In order to make sure participants build the intended discourse representation, they were asked to read the sentence aloud. After that, they pressed the space bar to add, to the right of Picture 1, Picture 2 with the fragment *And then* above it. Arnold and Griffin (2007) did not have this fragment, but it was included here because the author felt that at least in the Japanese version of the experiment (Experiment 2C), a sentence-initial connector like *sosite* ('and then') makes a null-pronoun subject sound more natural.³³ Following the fragment, participants described the action of the target entity on their own. When finished, they pressed the space bar again, causing everything on the screen to be replaced by Picture 3 with a sentence fragment (e.g., *A butterfly*) in the middle of the screen. Participants completed the sentence following the fragment. The experiment took about 20 minutes to complete.

4.2.4 Preparation for data analysis

The author transcribed the responses from participants' for Picture 2. They were expected to refer to the target entities with a pronominal subject or a repeated-name subject, but there were responses in which they either referred to target entities with a wrong RE (e.g., referring to MICKEY with *Minnie*) or referred to non-target entities (e.g., referring to the second entity in the Continue condition). Sometimes they accidentally pressed the space bar before describing Picture 2 or hit the space bar so hard that the trial was terminated; no utterances were recorded in

³³ Why *sosite* makes a null-pronoun subject sound more natural remains unclear. It may be that since the connector increases the continuity of a discourse, the null pronoun is more strongly preferred for a (highly accessible) continued discourse center (e.g., Grosz et al., 1995).

these trials. In addition, although the description sentence for Picture 1 ended with a period and the first letter of the fragment for Picture 2 (i.e., *And then*) was capitalized, some participants coordinated the description sentence for Picture 1 and their utterances for Picture 2. These utterances without a subject NP were treated as ungrammatical (null-subject) sentences in this English experiment. Responses other than appropriate ones with a pronominal or repeated-name subject for the target entity were excluded, accounting for 7.1% of the data.

4.2.5 Results

The plan was to analyze the (categorical) data (Pronouns vs. Repeated Names) using mixed-effects logistic regression models, but this turned out to be possible for only the English data (see Experiments 2B and 2C below for details). The contextual manipulations (Number of Entities, Gender [match/mismatch], and Transition) as well as Proficiency (C-test scores) were entered as fixed effects, and the random slopes and intercepts of Participants and Items were also included in the model. First, the One-Entity, Two-Entity GMM Continue, and Two→One-Entity GMM Continue conditions were compared for the effect of an additional entity in the discourse and in Picture 2. The maximal model is given in (32). Helmert coding was used for the comparisons across conditions, first comparing the One-Entity condition with the other two conditions combined (“Number of Entities–Discourse”) and then comparing the Two-Entity condition with the Two→One-Entity condition (“Number of Entities–Picture 2”).

(32) `glmer(RE ~ (Number of Entities–Discourse + Number of Entities–Picture 2) * Proficiency + (1 + (Number of Entities–Discourse + Number of Entities–Picture 2) | Participant) + (1 + (Number of Entities–Discourse + Number of Entities–Picture 2) * Proficiency | Item), data, family = binomial())`

However, this complex model failed to converge. Following the procedure of model comparison outlined in Chapter 3, a model without slopes for either random effect was used.

Next, two 2×2 analyses were conducted, one for the Number of Entities–Picture 2 and Gender (GMM vs. GM) and another for the Number of Entities–Picture 2 and Transition (Continue vs. Shift). The maximal models for these two analyses crossed the three predictors (i.e., Number of Entities–Picture 2, Gender or Transition, and Proficiency) as fixed effects. But

even after the slopes for Participant and Item were both removed, convergence was still not reached. Thus, the three-way interactions were further removed from the models as they were the most complex interaction of factors and the effect was the most difficult to interpret.

Presence of a competitor in the discourse

The first analysis compares the subject-RE data from the One-Entity condition, the Two-Entity GMM Continue condition, and the Two→One-Entity GMM Continue condition to examine whether the presence of a competitor in the discourse increases the use of repeated names. For the predictor Number of Entities–Discourse, the One-Entity condition was coded with -0.5 and the other conditions with 0.5 ; for the predictor Number of Entities–Picture 2, the Two-Entity condition was coded with -0.5 and the Two→One-Entity condition with 0.5 . These codes were later centered due to the unbalanced numbers of responses between contrasted conditions. Pronouns were set as the reference level to see the use of repeated names.

Figure 4.1 shows the mean proportion of repeated-name subjects in each of the three conditions, and Table 4.1 summarizes the statistical results.

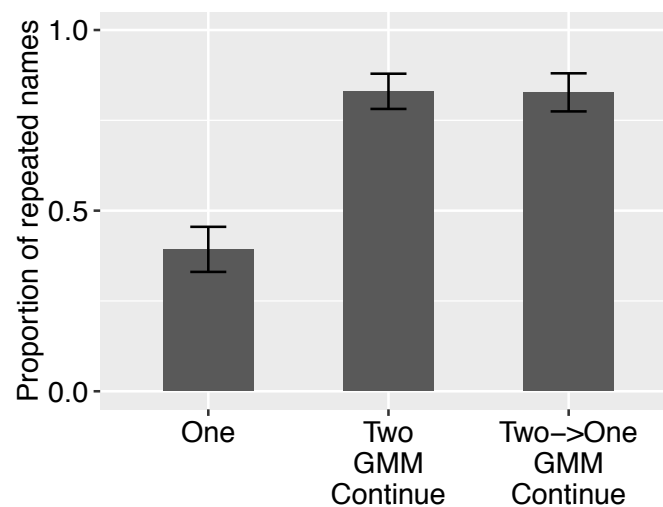


Figure 4.1. Mean proportion of repeated-name subjects in the One-Entity vs. GMM Continue conditions (English natives)

In the statistics tables, “*” indicates a significant effect at the $< .05$ level and “**” at the $< .01$ level.

Table 4.1. Statistical results for the comparisons of the One-Entity vs. GMM Continue conditions (English natives)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Number of Entities–Discourse	3.220	.331	9.719	< .001 **
Number of Entities–Picture 2	.029	.340	.084	.933
Proficiency	–.576	1.204	–.479	.632
Number of Entities–Discourse × Proficiency	–.528	1.166	–.453	.651
Number of Entities–Picture 2 × Proficiency	–.271	1.196	.226	.821

The data revealed that participants produced more repeated-name subjects when there were two entities in the discourse than when there was only one. However, the percentages of repeated names were almost identical in the Two-Entity and Two→One-Entity conditions (82.1% and 81.7%, respectively). Our native English speakers thus replicated the findings in Arnold and Griffin (2007): The presence of the second entity in the discourse increased the production of repeated-name subjects for the main entity, but the visual (un)availability of the second entity in Picture 2 did not influence the production of repeated names.

Number of Entities × Gender

The second analysis examines the main effects and interactions of Number of Entities–Picture 2 and Gender. The subset of the data for this analysis included the Two-Entity and Two→One-Entity GMM Continue conditions and their GM counterparts. For the predictor Number of Entities–Picture 2, the Two-Entity conditions were coded with –0.5 and the Two→One-Entity conditions with 0.5, and for the predictor Gender, the GMM conditions were coded with –0.5 and the GM conditions with 0.5. These deviation codes were later centered.

Figure 4.2 shows the mean proportion of repeated-name subjects in the four conditions, and Table 4.2 summarizes the statistical results.

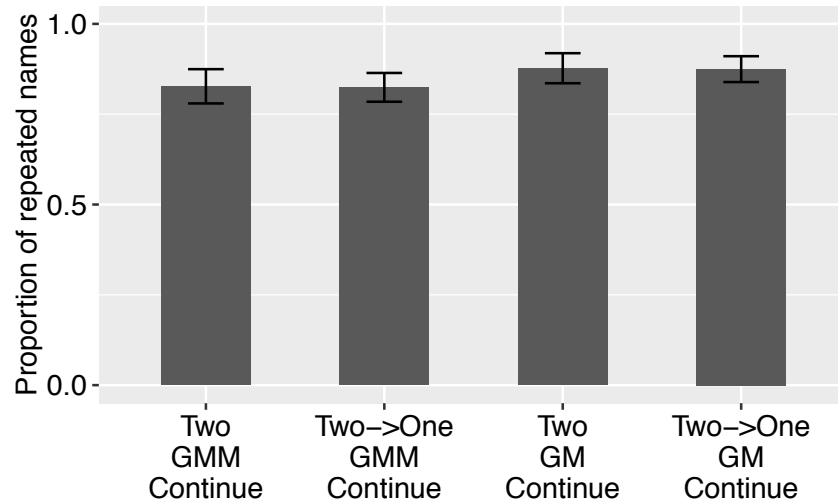


Figure 4.2. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (English natives)

Table 4.2. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (English natives)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Number of Entities–Picture 2	.005	.271	.018	.985
Gender	.683	.278	2.457	.014 *
Proficiency	.594	1.320	.450	.653
Number of Entities–Picture 2 × Gender	.022	.544	.041	.967
Number of Entities–Picture 2 × Proficiency	−1.228	.952	−1.290	.197
Gender × Proficiency	1.855	.975	1.901	.057

The results show that the percentages of repeated-name subjects in the GM conditions (87.1% in the Two-Entity condition and 86.9% in the Two→One-Entity condition) were significantly higher than those in the GMM conditions (82.1% and 81.8%, respectively). Thus, the findings from our participants, who were tested with a different set of test sentences and pictures than used previously, replicated the previous finding in (the pilot study of) Arnold and Griffin (2007): Native English speakers produce repeated-name subjects more often when the two entities in the discourse are of the same gender. This is likely due to a strategy of avoiding referent ambiguity.

Number of Entities × Transition

The third analysis examines the main effects and interactions of Number of Entities–Picture 2 and Transition. The data set included the Two-Entity and Two→One-Entity GMM Continue conditions and the Two-Entity and Two→One-Entity GMM Shift conditions. For Number of Entities–Picture 2, the Two-Entity conditions and Two→One-Entity conditions were coded with -0.5 and 0.5 , respectively, and for Transition, the Continue conditions and the Shift conditions were coded with -0.5 and 0.5 , respectively.

Figure 4.3 shows the mean proportion of repeated-name subjects, and Table 4.3 provides the statistical results.

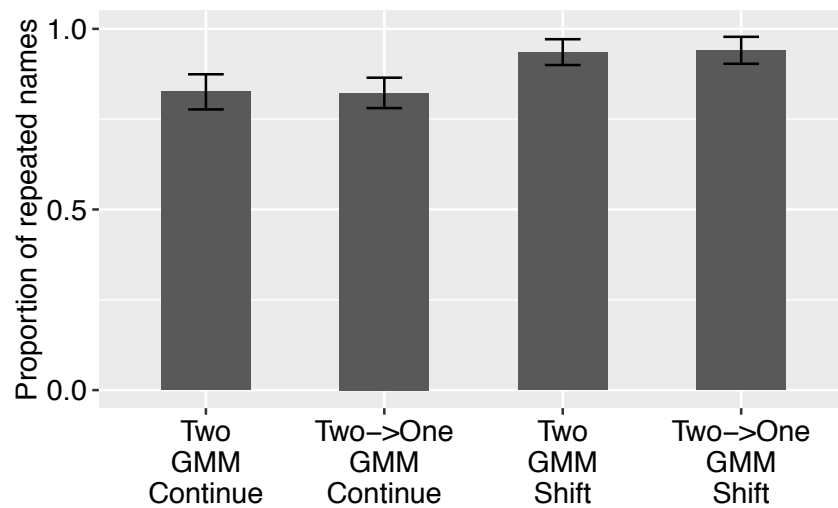


Figure 4.3. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (English natives)

Table 4.3. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (English natives)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Number of Entities–Picture 2	–.122	.325	–.376	.707
Transition	1.867	.366	5.103	< .001 **
Proficiency	.957	1.774	.539	.590
Number of Entities–Picture 2 × Transition	–.130	.638	–.204	.838
Number of Entities–Picture 2 × Proficiency	–.301	1.096	–.274	.784
Transition × Proficiency	3.303	1.265	2.611	.009 **

There was a main effect of Transition: Participants produced repeated-name subjects 93.1% of the time in the Two-Entity Shift condition and 93.6% of the time in the Two→One-Entity Shift condition, rates higher than the 82.1% in the Two-Entity Continue condition and the 81.8% in the Two→One-Entity Continue condition. Although the main effect of Transition was significant, there was not an interaction of Number of Entities–Picture 2 and Transition. This suggests that the visual (un)availability of the non-target entity in Picture 2 did not influence participants' subject-RE production, but that they were sensitive to the reduced accessibility of a second entity (competitor).

Interestingly, there was a significant interaction of Transition and Proficiency ($p = .009$). Figure 4.4 illustrates that the participants' scores on the C-test varied from 35 to 59, and that there was a slight negative relationship between the C-test scores and the proportion of repeated-name subjects in the Continue conditions in contrast to a slight positive relationship between them in the Shift conditions. Despite the participants all being native speakers of English, the production of repeated-names among those with higher C-test scores was closer to the expected production pattern than that among those with lower scores.

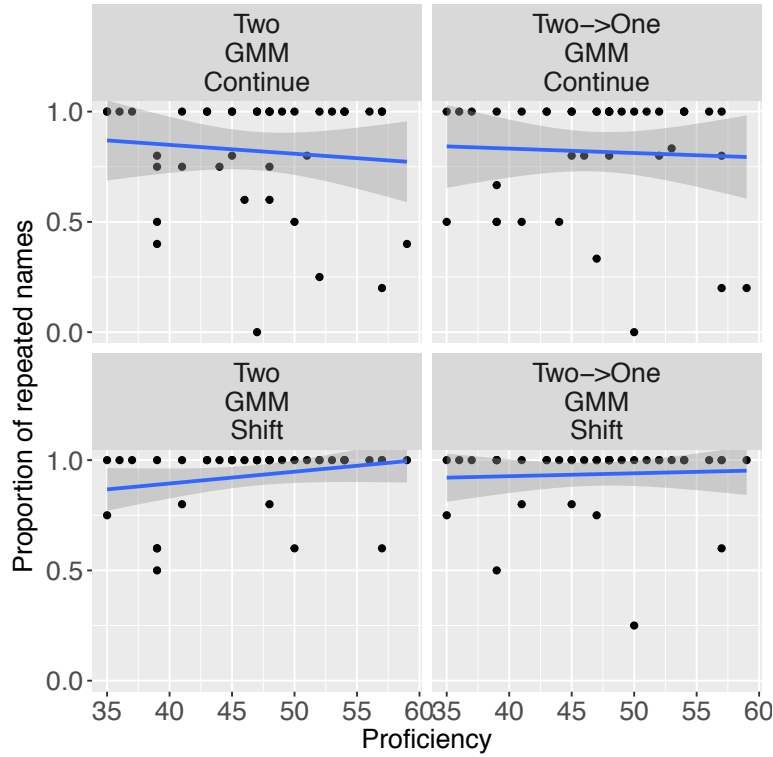


Figure 4.4. Proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions plotted along C-test scores (English natives)

Overall, this experiment replicated Arnold and Griffin’s (2007) findings that the presence of a competitor in the discourse, rather than the visual availability of a competitor, increases the use of repeated-name subjects, and so do gender congruence between discourse entities and discourse accessibility modulated by syntax or order of mention (i.e., Shift, not Continue).

4.3 Experiment 2B: Native Chinese speakers

4.3.1 Participants

The group of native Chinese speakers tested in Experiment 1B ($n = 52$) also participated in this experiment. One participant’s data were later discarded because a substantial number of responses were not recorded due to a technical problem.

4.3.2 Materials

The same sets of pictures in Experiment 1A were used in Experiment 2A. The English version of the description sentences for Picture 1 and the fragments for Pictures 2 and 3 were

translated by a native Chinese-speaking research assistant and checked by another one. When the second assistant suggested a more apt translation and the first assistant concurred, the translation was so modified. (The fragment for Picture 2 was translated as 然后 *ránhòu* [‘and then’].)

A sample one- (two-)entity description sentence for Picture 1 (for [31]) is given in (33).

- (33) 上周末, 米妮 (和 唐老鸭 一起) 去爬山了。
 shàngzhōumò Mǐnī (hé Tánglǎoyā yìqǐ) qù páshānle
 last weekend Minnie (and Donald together) went hiking
 ‘Last weekend, Minnie went hiking (with Donald).’

After the data from about half of the participants ($n = 25$) had been collected, it was noticed that the sentence is structurally ambiguous between ‘Last weekend, Minnie went hiking with Donald’ and ‘Last weekend, Minnie and Donald went hiking’ because the phrase *hé Tánglǎoyā* (‘with/and Donald’) is placed immediately after the subject NP. In an attempt to avoid this ambiguity, the description sentences of all the stimuli were modified by placing the intended singular subject NP before the temporal adverbial phrase, as in (34).³⁴

- (34) 米妮 上周末 (和 唐老鸭 一起) 去爬山了。
 Mǐnī shàngzhōumò (hé Tánglǎoyā yìqǐ) qù páshānle
 Minnie last weekend (and Donald together) went hiking
 ‘Minnie, last weekend, went hiking (with Donald).’

The Chinese stimuli before the modification to the description sentence, like the one in (33), will henceforth be called the “old stimuli,” and those after the modification, the “new stimuli.” Since the conjoined subject interpretation, e.g., ‘Minnie and Donald,’ is possible in the old two-entity stimuli, participants tested with these stimuli may be more inclined than those tested with the new two-entity stimuli to produce repeated-name subjects referring to (only) MINNIE for Picture 2 because the two entities (in the conjoined subject) are assumed to be at about the same level of discourse accessibility and because there is referent ambiguity in the GM conditions. The data from the two versions of the stimuli are analyzed separately and their patterns are then compared.

³⁴ My thanks to Bonnie D. Schwartz (personal communication, 15 July 2015) for this suggestion.

4.3.3 Procedure

This experiment used the same procedure as in the English experiment (Experiment 2A), except that a native Chinese speaker helped the author explain the instructions and answer questions from the participants.

4.3.4 Preparation for data analysis

Two native Chinese-speaking research assistants were hired to transcribe the participants' utterances and translate them into English (see Chapter 3). Only the responses that included a null-pronoun subject, an overt-pronoun subject, or a repeated-name subject produced for a target entity were statistically analyzed. The other responses in which participants referred to a non-target entity, used an incorrect RE for a target entity, or failed to record their utterances due to technical problems were discarded, which in total accounted for 14.3% of the data.

4.3.5 Results

Figure 4.5 shows the mean proportions of the three types of subject-REs elicited with the old stimuli, and Table 4.4 summarizes the descriptive statistics.

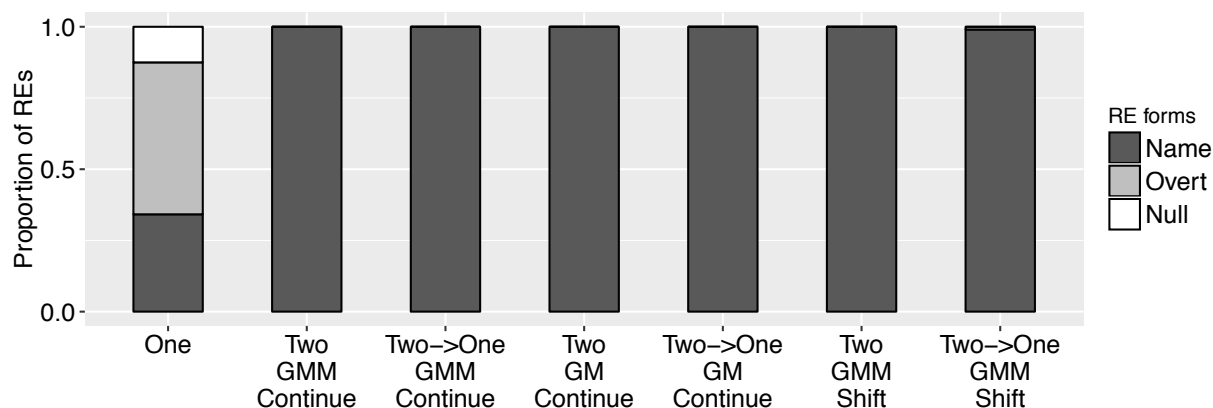


Figure 4.5. Mean proportion of subject-REs elicited with the old stimuli (Chinese natives)

Table 4.4. Mean percentage and SD of subject-REs elicited with the old stimuli (Chinese natives)

	One	Two	Two→One	Two	Two→One	Two	Two→One
		GMM	GMM	GM	GM	GMM	GMM
		Continue	Continue	Continue	Continue	Shift	Shift
Null	12.4%	0%	0%	0%	0%	0%	0%
Pronoun	(23.3)	(0)	(0)	(0)	(0)	(0)	(0)
Overt	52.4%	0%	0%	0%	0%	0%	1.3%
Pronoun	(36.7)	(0)	(0)	(0)	(0)	(0)	(6.7)
Repeated	35.2%	100%	100%	100%	100%	100%	98.7%
Name	(32.8)	(0)	(0)	(0)	(0)	(0)	(6.7)

Figure 4.6 shows the mean proportion of the three types of subject-REs elicited with the new stimuli; Table 4.5 summarizes the results of the descriptive statistics.

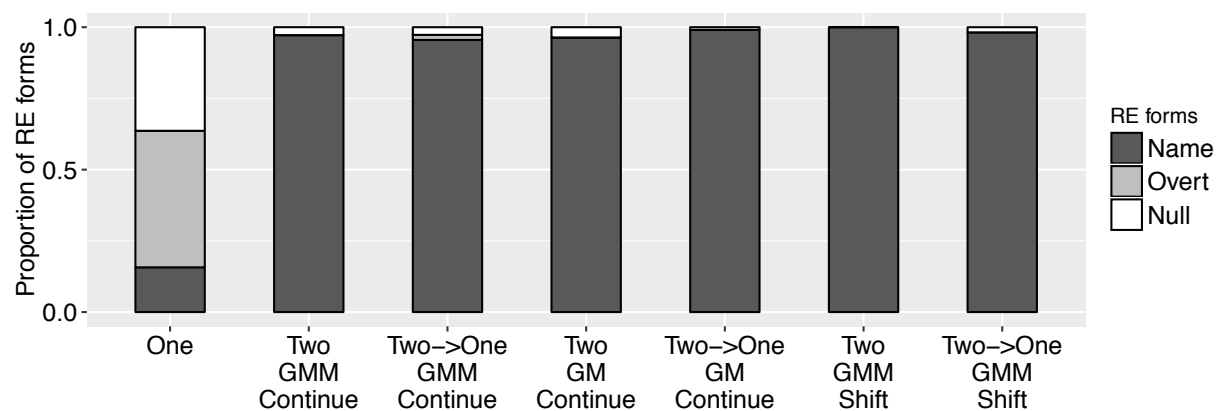


Figure 4.6. Mean proportion of subject-REs elicited with the new stimuli (Chinese natives)

Table 4.5. Mean percentage and SD of subject-REs elicited with the new stimuli (Chinese natives)

	One	Two	Two→One	Two	Two→One	Two	Two→One
		GMM	GMM	GM	GM	GMM	GMM
		Continue	Continue	Continue	Continue	Shift	Shift
Null	36.2%	2.7%	2.5%	3.1%	0.9%	0%	2.2%
Pronoun	(36.6)	(10.4)	(9.1)	(10.9)	(4.9)	(0)	(8.0)
Overt	49.2%	0%	1.5%	0%	0%	0%	0%
Pronoun	(36.7)	(0)	(7.8)	(0)	(0)	(0)	(0)
Repeated	14.6%	97.3%	96.0%	96.9%	99.0%	100%	97.8%
Name	(26.3)	(10.4)	(11.7)	(10.9)	(4.9)	(0)	(8.0)

In the One-Entity condition, repeated-name subjects were used about 35% of the time for the old stimuli and only about 15% of the time for the new stimuli (even though the One-Entity old stimuli cannot, by definition, be analyzed as having a conjoined NP subject). When the responses with a null-pronoun subject and those with an overt-pronoun subject were combined and contrasted with the responses with a repeated-name subject, a mixed-effects (binomial) logistic regression model indicated that the use of repeated names was significantly different between the two versions of the stimuli ($b = -1.914$, $z = -2.380$, $p = .017$). A significant result was likewise obtained when the responses with a null-pronoun subject were contrasted with the responses with an overt-pronoun subject combined with those with a repeated-name subject ($b = -2.780$, $z = -2.581$, $p = .010$).³⁵ In both data sets, the Chinese participants produced overt-pronoun subjects about 50% of the time, but they produced more repeated-name subjects with the old stimuli than with the new stimuli. The only difference between the two versions of the stimuli was the linear position of the subject, either after the sentence-initial temporal adverbial in the old stimuli or in sentence-initial position before the temporal adverbial in the new stimuli. It may be that since the subject in the new stimuli was placed in a more prominent

³⁵ The model `glmer(Pronoun.vs.Name.response ~ New.vs.Old.stimuli + (1 | Participant) + (1 | Item), data, family = binomial())` was used for the former comparison, and `glmer(Null.vs.Overt.response ~ New.vs.Old.stimuli + (1 | Participant) + (1 | Item), data, family = binomial())` was used for the latter.

position (i.e., at the beginning of the sentence), the accessibility of the entity denoted by the NP increased and the participants produced more null-pronoun subjects. Further research is needed to confirm this.

It is interesting that the participants used an overt-pronoun subject at least numerically more often than a null subject in the One-Entity condition. This may indicate that although the referent was highly accessible in their discourse representation, the slight discontinuity of the scenes in Pictures 1 and 2 broke the topic chain (see Chapter 2). Consider the sample item in (31). The description sentence for Picture 1 is “Last week, Minnie went hiking,” and participants were expected to produce a sentence like “And then, (she)/she/Minnie took a picture of sunflowers” for Picture 2. The description sentence for Picture 1 sets the discourse context (i.e., *background information* of the discourse), whereas what participants say about Picture 2 is expected to include the action of the entity (i.e., the *foreground information* of the discourse). Li and Thompson (1979) reported that when a group of Chinese speakers were asked to read sequences of sentences/clauses without a subject and add a *tā* (‘he’/‘she’) when they felt it was necessary, 75% of them added a *tā* as subject of the sentence that switched the foreground information about the protagonist to background information (see Section 2.2.2). The switch between background information and foreground information (at Picture 2) might have led the participants in the present study to produce the overt-subject pronoun frequently.

In contrast to the frequent use of pronouns in the One-Entity condition, the preferred subject-RE form in the discourses with two entities was always a repeated name. The new stimuli elicited relatively more null subjects; still, the percentage of repeated names was 96% or higher. Since logistic regression models did not converge, possibly due to a complete separation of the data, statistical comparisons among the conditions were not possible. But it is clear that the presence/absence of an additional entity greatly influenced the participants’ choice of RE form, whereas there were no effects of the other contextual manipulations (i.e., number of entities depicted in Picture 2, gender match/mismatch, and accessibility of the target referent). Although the Chinese participants did not disprefer the overt-pronoun subjects in the reading task (Experiment 1B) and produced them about 50% of the time in the One-Entity condition, they virtually never opted for them in two-entity contexts.

4.4 Experiment 2C: Native Japanese speakers

4.4.1 Participants

The group of native Japanese speakers tested in Experiment 1C ($n = 42$) also took part in this experiment.

4.4.2 Materials

The same picture sets in Experiment 1A/2A were used. The author translated the English version of the description sentences for Picture 1 and the sentence fragments for Pictures 2 and 3 into Japanese. (35) is a sample of a one- (two-)entity description sentence for Picture 1 (for [31]).

- (35) 先週末、 ミニーは (ドナルドと) ハイキングに 行きました。
sensyuumatu Minii-wa (Donarudo-to) haikingu-ni ikimasita
last weekend Minnie-TOP (Donald-with) hiking-to went
'Last weekend, Minnie went hiking (with Donald).'

The phrase *Donarudo-to* ('with Donald') is placed immediately after the subject NP, but unlike in Chinese, it cannot be coordinated with the subject NP *Minii-wa* because the topic marker *-wa* separates *Minii* ('Minnie') from *Donarudo* ('Donald').³⁶ (The fragment for Picture 2 was translated as *そして sosite* ['and then'].)

4.4.3 Procedure

The same procedure as in Experiments 1A and 2A was followed except that the author explained the instructions and answered questions from the participants in Japanese.

4.4.4 Preparation for data analysis

The author transcribed and translated the participants' utterances for Picture 2. Only the responses that included a null-pronoun subject, an overt-pronoun subject, or a repeated-name subject produced for a target entity were statistically analyzed. The other responses in which participants referred to a non-target entity, used a wrong RE for a target entity, or failed to record their utterances due to technical problems were eliminated, accounting for 2.5% of the data.

³⁶ *Minnie* and *Donald* can be coordinated as in *Minii-to Donarudo-wa* ('Minnie-and Donald-TOP').

4.4.5 Results

Figure 4.7 shows the mean proportion of the three types of subject-REs, and Table 4.6 summarizes the descriptive statistics.

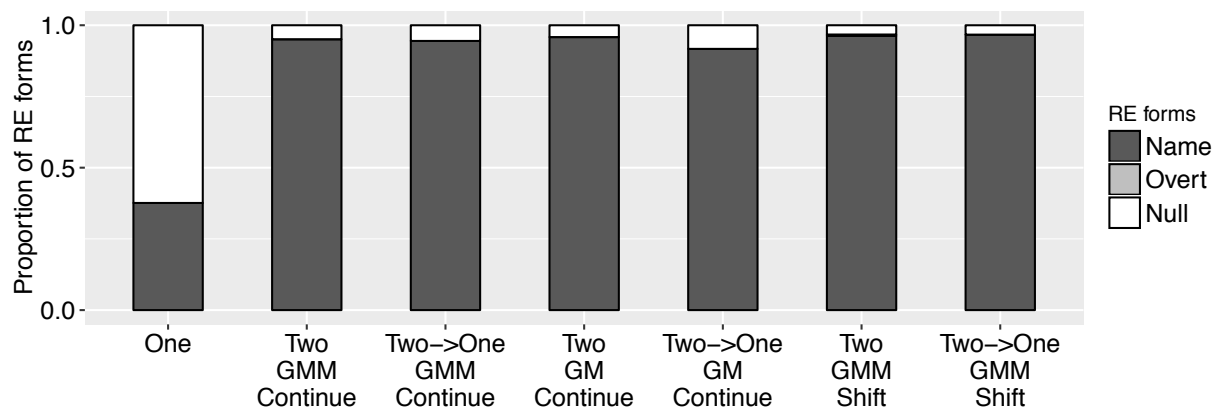


Figure 4.7. Mean proportion of subject-REs (Japanese natives)

Table 4.6. Mean percentage and SD of subject-REs (Japanese natives)

	One	Two GMM Continue	Two→One GMM Continue	Two GM Continue	Two→One GM Continue	Two GMM Shift	Two→One GMM Shift
Null	62.3%	4.5%	5.5%	4.1%	8.4%	3.4%	3.5%
Pronoun	(32.6)	(11.3)	(11.7)	(13.4)	(17.4)	(8.0)	(10.3)
Overt	0%	0%	0%	0%	0%	0.5%	0%
Pronoun	(0)	(0)	(0)	(0)	(0)	(3.0)	(0)
Repeated	37.8%	95.5%	94.5%	95.9%	91.6%	96.1%	96.5%
Name	(32.6)	(11.3)	(11.7)	(13.4)	(17.4)	(8.3)	(10.3)

In the One-Entity condition, Japanese participants produced a null-pronoun subject more frequently than a repeated-name subject (62% vs. 38%), and they never produced an overt-pronoun subject. It is possible that although participants were familiar with the Disney characters, the social constraints on the use of overt pronouns were not met (see Section 2.2.3).

However, the patterns here are consistent with the RT patterns in the one-entity context of Experiment 1C (Chapter 3): In the one-entity context, these participants likewise processed null-pronoun subjects significantly faster than overt-pronoun and repeated-name subjects. As in the Chinese version of the experiment, logistic regression models did not converge, so comparisons of subject-REs across conditions were not possible.

Figure 4.7 and Table 4.6 clearly indicate that in the discourses with two entities, participants overwhelmingly produced a repeated-name subject (rates $\geq 94.5\%$). When they did not produce a repeated name, they virtually always produced a null pronoun; there was only one response that contained an overt pronoun (in the Two-Entity GMM Shift condition). The dispreference of overt subject pronouns is again consistent with the RT patterns in the two-entity contexts of Experiment 1C: In two-entity contexts, these participants never processed overt-pronoun subjects more quickly than null-pronoun or repeated-name subjects.

It is evident that presence/absence of an additional entity in the discourse strongly influenced the Japanese participants' choice of subject-RE form, but effects of the other contextual manipulations were not observed.

4.5 Discussion

Experiment 2 was conducted to examine how the number of entities in the discourse, the number of entities depicted in Picture 2, the gender match/mismatch of two entities in the discourse, and the discourse accessibility of the target referent influence native English, Chinese, and Japanese speakers' production of subject-REs. It was found that the presence/absence of a non-target entity (competitor) greatly influenced the forms of REs that were produced for a target entity. English speakers produced overt-pronoun subjects about 60% of the time in the One-Entity condition but repeated-name subjects over 80% of the time in the Two-Entity GMM Continue and Two→One-Entity GMM Continue conditions. They could have used overt-pronoun subjects in the same way in all three of these conditions because the gender feature on pronouns can unambiguously and felicitously specify the intended referent. However, the participants chose the more explicit form in contexts with two entities. The results are in line with Arnold and Griffin's (2007) interpretation that the presence of an additional entity in the discourse representation reduces the activation level of the target entity due to competition for attentional resources between the entities and so the use of an explicit RE increases.

A clear effect of Gender match/mismatch was found in the English speakers. The contexts with two gender-matched entities elicited repeated-name subjects significantly more often than those with two gender-mismatched entities did (a difference of 5 percentage points). The former is most likely the result of ambiguity avoidance; of the two RE forms tested in this experiment, only repeated names could unambiguously specify the target entity, the main entity in this case. A clear effect of Transition was also found in this group. The participants produced more repeated-name subjects when the target referent was a competitor (in the description sentence) than when it was the maintained main entity (a difference of 9 to 12 percentage points). One might expect (contrary to the results of Arnold & Griffin, 2007) that in the GMM Shift conditions, participants would produce a pronominal subject for the target entity, both because a gender-marked pronoun can uniquely identify the intended referent and because the target entity was made visually salient in Picture 2 (i.e., depicted as larger); however, this was not the case: The production of pronominal subjects was very limited.

Chinese speakers produced null-pronoun subjects in the One-Entity condition 12%–36% of the time and almost always produced repeated-name subjects in the other conditions (all with two entities). The modification of the stimuli reduced the production of repeated-name subjects in this condition. We speculate that it may be because the new stimuli had a subject antecedent in the initial position of the sentence (i.e., before a temporal adverbial phrase, as in the equivalent of *Minnie last weekend went hiking*). It was predicted that they would prefer null pronouns in the One-Entity condition and (more explicit) overt pronouns in the two GMM Continue conditions. However, they almost never produced overt pronouns. This is likely due to avoidance of referent ambiguity; the masculine and feminine pronouns in Chinese are phonologically identical and so the speakers used repeated-name subjects to specify the intended referents unambiguously (Bonnie D. Schwartz, personal communication, 12 May 2017). This suggests that speakers do not simply use a more explicit form when an additional entity is in the discourse but also evaluate whether the form induces referential ambiguity. Because of the extremely high proportion of repeated-name subjects in the GMM Continue conditions, noticeable effects of Gender match/mismatch and Transition were not found.

Japanese speakers produced a null-pronoun subject over 60% of the time in the One-Entity condition and almost always produced a repeated-name subject in the conditions with two entities. They could have used null pronouns in the two GMM Continue conditions (recall

that in the self-paced reading Experiment 1C, they showed a clear preference for null-pronoun subjects for a continued discourse center), but instead they produced repeated names at rates greater than 94%. Unlike in Chinese, overt pronouns in Japanese are phonologically distinct (*kare/kanozyo* ‘he’/‘she’) and hence do not create referential ambiguity. It is likely that the preference of Japanese speakers for repeated names in the GMM Continue conditions is due to dispreference of overt pronouns; overt pronouns sound “foreign,” and/or, moreover, the discourse contexts in the experiment did not satisfy the socio-cultural constraints that make the use of overt pronouns felicitous in Japanese (e.g., Hinds, 1987—see Chapter 2). As in Chinese, because of the extremely high proportion of repeated-name subjects in the GMM Continue conditions, noticeable effects of Gender match/mismatch and Transition were not found.

When comparing the results from the three groups, we found some interesting similarities and differences. First, in all three groups, there was a large amount of variation in the use of REs in the One-Entity condition. Although the mean proportion of repeated-name subjects was similar among the three groups (38% in English, 35% in Chinese with the old stimuli [though only 15% with the new stimuli], and 38% in Japanese), the SDs were large (36 in English, 33 in Chinese with the old stimuli [27 with the new stimuli], and 33 in Japanese). This indicates that even within the same language group, participants’ RE choice varied greatly, some producing repeated names more often than others. This is interesting because numerous studies have found the correlation of discourse accessibility and RE form but not all native speakers in the present study performed accordingly. The results remind us that the choice of RE form in contexts like those tested here is (typically) a *preference* and not something that grammar determines; for instance, a repeated-name subject used for an accessible entity does not lead to a misunderstanding of the message (but see the discussion of Japanese *kare/kanozyo* below).

The variability within each group also suggests that factors other than the number of entities helped guide the speakers’ RE-form choice. It may be that their prior experience during the experiment affected the activation level of target referents. We presented items in random order, and so even the participants who were assigned to the same item list encountered the same set of items in different orders. If a participant who, say, saw an item where MICKEY was the main entity again sees him as the main entity in the following item, then the participant may be more likely to produce a pronominal subject than the participant who previously saw an item where, say, DAISY was the main entity.

Another factor might be the amount of attention participants paid to the discourse context. Zerkel and Arnold (2016) reported that when eye movement was monitored as English native speakers described pairs of pictures, the participants who directed their attention more to the context information (i.e., the first picture) were more likely than those who directed less attention to the context to connect the events in the two pictures using a connector (e.g., *and*, *then*) and to produce a reduced RE form (e.g., a pronoun) for an entity in the second picture. The participants in our study produced utterances for Picture 2 following the fragment *and then* (*ránhòu* in Chinese and *soshite* in Japanese), so this should have encouraged them to connect the events in Pictures 1 and 2 and produce a reduced subject-RE frequently at least in the One-Entity condition. However, because the participants were *forced* to use the connector, rather than naturally producing it, some may have simply read aloud the connector presented on the screen without trying to link the events. These participants would have been more likely to produce a repeated-name subject for the target entity in Picture 2. Indeed, the procedure of our production task might in general have strengthened the sense of discontinuity. In each trial, we first presented Picture 1 with the description sentence on a computer screen, and after participants finished reading aloud the sentence, they added Picture 2 next to Picture 1 by pressing the space bar. Although all participants knew that the two pictures depicted a sequence of events, the key press might have given some participants an impression of discontinuity.

The perceived discontinuity of the discourse might be the cause of the RE-production difference between Chinese and Japanese in the One-Entity condition. In this condition, the Chinese speakers produced a null-pronoun subject in old/new stimuli 12%/36% of the time and an overt-pronoun subject 52%/49% of the time, whereas the Japanese speakers produced a null-pronoun subject 62% of the time but never produced an overt-pronoun subject. If we consider Yang et al.'s (comprehension) results of RE preferences in Chinese as well as the raw-RT patterns in our (comprehension) Experiment 1B above, then the Chinese participants' use of overt-pronoun subjects in the One-Entity condition is perhaps not surprising. Overt-pronoun subjects were produced more frequently than null-pronoun subjects (52% vs. 12% with the old stimuli, 49% vs. 36% with the new stimuli) probably because there was a slight semantic discontinuity of sentences (i.e., a break of a topic chain); there was a switch from the background information in the description sentence for Picture 1 to the foreground information

in the expected utterance for Picture 2 (e.g., Li & Thompson, 1979; see also Tomlin & Pu, 1991, for attentional shift during picture description).

But whatever discourse features led to the use of overt-pronoun subjects in Chinese, they did not lead to the use of overt-pronoun subjects in Japanese. It may be that Japanese speakers did not use *kare/kanozyo* because despite being (very) familiar with the four Disney characters, they do not have a “personal relationship” with them (speakers use *kare/kanozyo* for someone they personally know; see Chapter 2). Alternatively, the fact that of the 1,502 utterances included in data analysis for the Japanese speakers, only one had *kare* as the subject suggests that some grammatical property of *kare/kanozyo* discouraged the speakers from using these lexical items. More research is needed to identify what discourse features or linguistic factors lead to the avoidance of *kare/kanozyo*.

CHAPTER 5

EXPERIMENT 3: ONLINE COMPREHENSION OF REFERENTIAL EXPRESSIONS BY L2 LEARNERS OF ENGLISH

5.1 Introduction

In Chapters 2, 3, and 4, we looked at how native speakers use referential expressions (REs) in discourse. In text analyses, researchers have found that the more salient and accessible a discourse entity is in the speaker's and the hearer's discourse representations, the less explicit RE form the speaker uses to refer to the entity. Previous psycholinguistic studies (e.g., Gordon et al., 1993) and the English Experiment 1A of the present study (Chapter 3) showed that processing difficulty occurs when a repeated name is used for a highly accessible entity (i.e., the Repeated Name Penalty [RNP]). Researchers who looked at native Italian and/or Spanish speakers (e.g., Carminati, 2002; Filiaci et al., 2014; Gelormini-Lezama & Almor, 2011), native Chinese speakers (e.g., Yang et al., 1999), and native Japanese speakers (Shoji et al., 2017) as well as the present study's Chinese Experiment 1B (the raw RT analysis in the one-entity context) and Japanese Experiment 1C also found that native speakers of null-subject languages process an overt form of REs (e.g., overt-pronoun and/or repeated-name subjects) more slowly than a null-pronoun subject. Cross-linguistic differences emerge in the processing of sentences with an overt-pronoun subject; in the present comprehension study (Chapter 3), Chinese speakers *never* processed an overt-pronoun subject more slowly than a null-pronoun subject, whereas Japanese speakers clearly did so.

We now turn our discussion to the use of REs in discourse by adult L2 learners (L2ers). During the course of L2 acquisition, L2ers need to acquire various aspects of their Target Language (TL). It is interesting and important to investigate how they utilize REs because it involves a complex process of acquisition and use. L2ers first need to be able to calculate the accessibility of discourse entities. A variety of determinants of discourse accessibility have been proposed (see Chapter 2), but the one relevant to the present study is grammatical role (subject vs. object) of the referents at issue. Proficient L2ers should be able to extract the intended message from a sentence and construct a discourse representation. If their discourse representation is (more or less) the same (in the relevant respects) as what adult native speakers construct, then the semantic representation of the entity denoted by the subject NP should be

more accessible than that of the entity denoted by an object NP. However, since L2 parsing of a sentence can require much processing effort, their processing routines may not be native-like. For instance, when L2ers finish processing a sentence (in an S-before-O language), an entity encoded in object position might be more accessible than an entity encoded in subject position (recency, as opposed to prominence of grammatical function, e.g., subject > object).

L2ers also need to know what RE forms are available in their TL, how they function, and how to choose a more appropriate RE form depending on the degree of accessibility of an entity. Different languages use different sets of RE forms (and those forms can function differently cross-linguistically, e.g., overt pronouns in Italian vs. Spanish and in Chinese vs. Japanese—see Chapter 2). So, L2ers who speak a non-null-subject language as their native language (L1) and acquire a null-subject language as their TL have to learn how to use the null subject pronoun; those who speak a null-subject language as their L1 and acquire a non-null-subject language have to learn not to use their null subject pronoun but use another TL form for a highly accessible entity. Even when their L1 and TL have ostensibly the same form of REs (e.g., overt pronouns), they may well function differently in the two languages. English subject pronouns can readily take the subject NP as antecedent; by contrast, Italian overt subject pronouns preferentially do not, but they do readily take an object NP as antecedent.

What makes the L2 acquisition of REs even more interesting is that L2ers need to learn how to use REs without explicit instruction on the matter. The choice among of RE forms is typically *optional* in nature;³⁷ one can use a pronoun, a repeated name, or another type of RE to refer to an entity. Also, the selection of RE form depends on multiple properties including syntactic structure and the type of verb in the sentence. Therefore, it is difficult for instructors to explicitly teach when to use which form or to explain the reason for corrections to L2ers' use of dispreferred RE forms. (Such things are only very superficially touched on in foreign language textbooks, if at all.) L2ers somehow need to learn through experience how certain features of discourse make a particular RE form more appropriate or more felicitous than another.

Experiment 3 below tests intermediate-to-advanced L2ers of English whose L1 is Chinese or Japanese by using the same reading task from Experiment 1. If the L2ers, like native English speakers, evince the RNP for conditions with the highly accessible entity denoted by a subject antecedent but not for conditions with the less accessible entity denoted by an object

³⁷ *pace* constraints like those of Binding Theory

antecedent, then this would suggest that they recognized the syntactic difference between the two antecedent NPs, represented the entities denoted by those NPs with differentiated accessibility in their mental discourse model, and preferentially associated a pronominal subject with the more accessible entity. As this process indicates, RE comprehension requires the integration of lexical/morphosyntactic information and discourse/pragmatic information. Whether L2ers are capable of doing this in a native-like manner has been a question in L2 research.

The next section reviews some of the previous studies that investigated L2ers' comprehension of REs in discourse. We will first review studies that found L2ers' nonnative-like interpretation of subject-REs and reconsider the discussion of whether the potential causes of such interpretations lie at the level of knowledge representation or processing resources (e.g., Sorace, 2011; Sorace & Filiaci, 2006). Although early work put forth representational explanations, results from recent studies are more in line with processing explanations. Moreover, some studies even suggest L2ers' successful integration of different sources of information. We will discuss how we can interpret these mixed results.

5.1.1 *L2ers' comprehension of subject-REs in discourse*

Sorace and Filiaci (2006) examined how near-native L1-English L2ers of Italian and native Italian speakers interpret the null and overt subject pronouns in sentences like (36).

- (36) La mamma dà un bacio alla figlia mentre **ø/lei** si mette il cappotto.
 the mother gives a kiss to the daughter while (she)/she wears the coat
 ‘The mother kisses her daughter while she/(she) is wearing her coat.’

(Sorace & Filiaci, 2006, p. 352, [10])

The participants were tested in a picture-verification task. In each trial, they read a bi-clausal sentence like (36), with either a null or overt pronominal subject, and saw a set of three pictures. Then they were asked to choose one or more pictures that matched the meaning of the sentence. Remember that in Chapter 2, we saw that Italian natives preferentially interpret the null-pronoun subject as taking a subject antecedent and the overt-pronoun subject as taking a non-subject antecedent (the Position of Antecedent Strategy; Carminati, 2002). It was thus predicted that in (36), Italian natives should prefer the matrix subject *la mamma* (‘the mother’) as the antecedent

for the null-pronoun subject but prefer the matrix object *la figlia* ('the daughter') as the antecedent for the overt-pronoun subject. If the near-native L2ers can utilize the same processing strategy, they should also show these same antecedent preferences.

The results showed that for the null subject, the native speakers and the L2ers chose the picture indicating the interpretation in which the matrix subject was the antecedent 51% and 46% of the time, respectively; for the overt-pronoun subject, however, the native speakers chose the matrix subject as antecedent only 8% of the time, indicating their dispreference for this interpretation, whereas the L2ers chose it 27% of the time. Sorace and Filiaci state that the difference between the rates in the latter condition (8% vs. 27%) was statistically significant. Thus, the results indicate that the L2ers show native-like interpretation of the null subject pronoun, but they are more likely than native speakers to associate an overt subject pronoun with a subject antecedent.³⁸ Belletti et al. (2007) found similar interpretation patterns from their L1-English near-native L2ers of Italian.

A nonnative-like interpretation of subject-REs has also been found in L2ers of a non-null-subject language. A non-null-subject language does not have a null vs. overt pronominal subject contrast, but a division of labor can be found between a subject pronoun (the most reduced RE form in the language) and a more explicit subject form.

For instance, Wilson, Keller, and Sorace (2007) and Wilson, Keller, and Sorace (2009) examined how, respectively, native German speakers and advanced L1-English L2ers of German interpret the pronoun *er* ('he') and the (more explicit) demonstrative *der* ('he') in discourse. They employed a visual-world eye-tracking task in which participants looked at a picture on a computer screen while listening to (pairs of) sentences like those in (37), and their eye movements were monitored.

³⁸ Schwartz (2011) pointed out that even the native Italians in this study did not have an antecedent preference for the null subject (i.e., they chose (the picture indicating) a subject-antecedent interpretation only 51% of the time), which sharply contrasts with the subject-antecedent preference (at 81%) found for the native Italian participants in Carminati (2002).

(37) Der Kellner erkennt den Detektiv als das Bier
 The.MASC.SG.NOM waiter recognizes the.MASC.SG.ACC detective as the beer
 umgekippt wird.

tipped-over is

‘The waiter recognizes the detective as the beer is tipped over.’

Er/Der ist offensichtlich sehr fleißig.

he.pron/he.dem is clearly very hard-working

‘He is clearly hard working.’

(adapted from Wilson, Sorace, & Keller, 2009, p. 637, [2a])

Wilson et al. found that upon hearing the subject pronoun *er*, the native participants had similar proportions of looks to (the image of) the entity denoted by the subject NP (e.g., THE WAITER) and to the one denoted by the object NP (e.g., THE DETECTIVE), showing no referent preference. But when they processed the corresponding demonstrative, they showed a clear preference for the entity denoted by the object NP (e.g., THE DETECTIVE). By contrast, the L2ers preferred the subject NP as the antecedent for the subject pronoun but had equal looks to the two entities when hearing sentences with a demonstrative subject. This lack of a referent preference for the demonstrative implies that, unlike the German natives, the L2ers considered the subject as a potential antecedent for it.³⁹ Together with the results from the near-native L2ers of Italian in Sorace and Filiaci (2006) and Belletti et al. (2007), it seems that L2ers (can) associate the most reduced RE form with a highly accessible discourse entity, but even highly proficient L2ers tend to over-extend the scope of a more explicit form to an accessible entity.

Then what would be the cause of the nonnative-like interpretation of subject-REs? Sorace (2011) discusses whether it lies at the level of knowledge representations (the *representational account*) or at the level of processing strategies required to integrate multiple sources of information (the *processing resources account*). The representational account could say that the overuse of the overt subject pronoun by near-native L2ers of Italian results from the mismapping of a linguistic (e.g., interpretable) feature onto a pronoun. The idea, originally put forth by

³⁹ Also relevant might be the fact that demonstrative subjects are typically not given much attention in German language classes (Robert Bley-Vroman, personal communication; see also Ellert, 2013).

Tsimpli, Sorace, Heycock, and Filiaci (2004) for attrition and extended to near-native L2ers by Sorace and Filiaci (2006), is that in native Italian (and Greek) speakers' representations, the null subject pronoun is associated with the (interpretable) feature [–Topic Shift] and the overt subject pronoun is associated with the [+Topic Shift] feature; however, in the near-native L1-English L2ers' representations of Italian, overt subject pronouns are allowed to be associated with both the [–Topic Shift] and [+Topic Shift] features because the corresponding subject pronouns in their L1 English can readily be used for both a continued discourse topic and a shifted topic. This is why the L2ers are more likely than Italian natives to take a subject antecedent for the overt-pronoun subject.

However, subsequent research disconfirmed this representational (transfer) account in that over-extension of the overt subject pronoun to a discourse-topic antecedent was found in the acceptability judgments of intermediate to advanced L1-Greek L2ers of Spanish (Lozano, 2009), both null-subject languages.⁴⁰ Thus, if the form-interpretation mapping in these L2ers' knowledge representations is already native-like, then the factor(s) responsible for nonnative-like interpretation should come from another source.

Another piece of evidence against the representational account can be found in a recent study by Ellert (2013). She used a visual-world eye-tracking task to examine the interpretation of German pronominal and demonstrative subjects by L1-Dutch L2ers of German. The L2ers heard sentences like (38).

(38) Der Schrank ist schwerer als der Tisch.

‘The cupboard is heavier than the table.’

Er/Der stammt aus einem Möbelgeschäft in Belgien.

‘It (pronoun/demonstrative) originates from a furniture store in Belgium.’

Das Sofa soll nächste Woche geliefert werden.

‘The sofa is supposed to be delivered next week.’

(Ellert, 2013, p. 178, [4])

⁴⁰ It is not known whether Greek and Spanish behave in exactly the same way in terms of antecedent preferences for null vs. overt pronominal subjects. (Recall that Italian and Spanish, very closely related Romance null-subject languages, do not. See Section 2.2.1 above.)

Prior to this study, Ellert (2010) found that native German speakers who heard passages like (38) preferentially interpreted the pronoun subject *er* as taking as antecedent the first NP (NP1, the subject) of the context sentence *der Schrank* ('the cupboard')⁴¹ but interpreted the demonstrative subject *der* as taking as antecedent the second NP (NP2, the non-subject) *der Tisch* ('the table'). She also tested native Dutch speakers on the Dutch version of the materials and found parallel antecedent preferences for the pronoun subject *hij* and the demonstrative subject *die*.⁴² Thus, one would predict that the L1-Dutch L2ers of German would show clear native-like interpretations of the German pronoun and demonstrative subjects because these subject-REs in their L1 and TL exhibit the same interpretation preferences. However, Ellert (2013) found that the L1-Dutch L2ers of German showed an NP1 antecedent preference for the pronominal subject and no antecedent preference for the demonstrative. This interpretation pattern is similar to the one in Wilson et al. (2009) for the L1-English L2ers of German, but interestingly, different patterns emerged when Ellert (2013) divided her L2ers into two groups by German proficiency. She found that both the lower-proficiency group and the higher-proficiency group preferred NP1 as the antecedent for the pronominal subject, whereas for the demonstrative subject, the lower-proficiency group showed an NP1 preference and the higher-proficiency group an NP2 preference, at least in some of the late-time windows after the onset of the demonstrative. This suggests that at least the nonnative-like interpretation preference in the lower-proficiency group cannot be explained by the representational (transfer) account.

Moreover, the results from Roberts, Gullberg, and Indefry (2008) suggest that regardless of whether L2ers speak a null-subject or non-null-subject language as their L1, they have difficulty using discourse information when interpreting subject-REs in their non-null-subject TL. Roberts et al. tested advanced L2ers of Dutch whose L1 was either Turkish (a null-subject language) or German (a non-null-subject language) as well as native Dutch speakers on potentially ambiguous subject pronouns in offline and online tasks. In an offline comprehension questionnaire, the three

⁴¹ Note that this result is slightly different from the one in Wilson et al. (2007).

⁴² The Dutch version of the first two sentences in (38) is as follows:

(i) De kast is zwaarder dan de tafel.

Hij/Die is afkomstig uit een meubelwinkel in België.

(Ellert, 2010, p. 57, [52])

groups of participants read Dutch sentences like (39) and indicated the referent of the pronominal subject *hij* ‘he’ in the second sentence.

(39) Peter en Hans zitten in het kantoor.

‘Peter and Hans are in the office.’

Terwijl Peter aan het werk is, eet **hij** een boterham.

‘While Peter is working, he is eating a sandwich.’

Het is een rustige dag.

‘It is a quiet day.’

(Roberts et al., 2008, p. 343, [4a])

The results showed that Dutch natives chose PETER as the referent of *hij* (‘he’) 100% of the time, L1-German L2ers did so 91% of the time, but L1-Turkish L2ers did this only 55% of the time. Roberts et al. took the results as indicating L1 influence on the L2ers’ interpretation of the pronominal subject; whereas German *er* (‘he’) behaves like Dutch *hij* (‘he’) in the context of (39), a Turkish overt-pronoun subject in this context (*o* [‘he’]), according to the authors, disallows *Peter* as its antecedent (p. 336).

Despite these differences between the L1-German and L1-Turkish L2ers in the offline task, the two groups patterned together in the eye-tracking-while-reading task. Roberts et al. had the same participants read three types of passages like those in (40).

(40) a. **Local resolution**

De werknemers zitten in het kantoor. Terwijl Peter aan het werk is, **eet hij** een boterham. Het is een rustige dag.

‘The workers are in the office. While Peter is working, he is eating a sandwich. It is a quiet day.’

b. **Disjoint resolution**

De werknemers zitten in het kantoor. Terwijl Peter aan het werk is, **eten zij** een boterham. Het is een rustige dag.

‘The workers are in the office. While Peter is working, they are eating a sandwich. It is a quiet day.’

c. **Optional resolution**

Peter en Hans zitten in het kantoor. Terwijl Peter aan het werk is, **eet hij** een boterham. Het is een rustige dag.

‘Peter and Hans are in the office. While Peter is working, he is eating a sandwich. It is a quiet day.’

(Roberts et al., 2008, p. 341, [3])

The pronoun *hij* (‘he’) in (40a) takes the local antecedent *Peter*, the *zij* (‘they’) in (40b) takes the antecedent *de werknemers* (‘the workers’) in the first sentence, and the *hij* in (40c) can take either *Peter* or *Hans* as its antecedent. The results indicated that the RT of the critical region (the verb and the subject of the matrix clause in the second sentence) was fastest in the Optional-Resolution condition in the Dutch native speakers, whereas the RT in this condition was longest in both L2 groups. Roberts et al. say that in (40c), PETER is highly accessible because the NP denoting it (*Peter*) is the most recently mentioned and it is mentioned in both the first and second sentences. According to the authors, the Dutch natives had no problem assigning a referent to the pronoun by using its accessibility; however, the L2ers experienced processing difficulty because of the referential ambiguity of the pronoun, that is, they were not guided by the discourse accessibility of PETER and so evaluated both PETER and HANS as a potential referent

(and so took longer).⁴³ Roberts et al. concluded that the dissociation of the online RT results between the two L2 groups (despite the target-like convergence of their offline results) supports the idea that regardless of the grammatical properties in their L1, L2ers seem to have difficulty in real-time processing, supporting the processing resources account. These nonnative-like RE interpretations by, inter alia, (near-native) L2ers of various L1-TL pairings were taken as evidence for the Interface Hypothesis (IH; e.g., Sorace, 2011, 2012), whose recent formulation states that “performance at the syntax-pragmatic interface may remain permanently unstable” (Sorace, 2012, p. 213) because “the integration of syntactic and pragmatic conditions remains less than optimally efficient” (2011, p. 26).

While much of the evidence suggests a processing explanation for L2 difficulty with (subject) REs, it is far from a settled area of research. Successful integration of discourse information with (subject) RE choice is possible in some cases. The native-like results from Ellert (2013) mentioned above suggest that the higher-proficiency L1-Dutch L2ers of German (at Level C of the Common European Framework of Reference) were successfully able to integrate syntax and discourse information in the types of discourse they used. In addition, unlike the L2ers in Roberts et al. (2008), L2ers who speak a null-subject language as their L1 acquiring a non-null-subject language as their TL are also capable of information integration from two sources. Cunnings, Fotiadou, and Tsimpli (2016) examined whether low-intermediate to advanced adult L2ers of English whose L1 is Greek can use gender information when interpreting an ambiguous English pronoun. Native Greek speakers have been found to interpret an overt subject pronoun as shifting a discourse topic (e.g., Papadopoulou, Peristeri, Plemenou, Marinis, & Tsimpli, 2015); so if L1-Greek L2ers interpret English pronouns like Greek overt pronouns, they will (sometimes) prefer a referent that is different from the one native English speakers prefer. During an experiment in the visual-world paradigm, participants heard sentences like those in (41) while looking at disambiguating pictures on a computer screen.

⁴³ Although the task had comprehension questions, Roberts et al. do not tell us what they probed. If the questions did not ask for the referent of the subject pronouns at issue, then this casts doubt on their interpretation of the results, because then there is no way to know whether participants assigned *any* referent to them. For instance, it could be that the RT difference for (40c) stems from the two L2 groups trying hard to resolve the referential ambiguity of the *hij* ‘he,’ whereas the Dutch natives were satisfied with no resolution (i.e., with vagueness) and thus their RTs were short (Bonnie D. Schwartz, personal communication).

(41) a. **Subject bias, Unambiguous**

After Peter spoke to Mrs. Jones by the till in the shop, **he** paid for the expensive ice cream that looked tasty.

b. **Subject bias, Ambiguous**⁴⁴

After Peter spoke to Mr. Smith by the till in the shop, **he** paid for the expensive ice cream that looked tasty.

c. **Object bias, Unambiguous**

After Mrs. Jones spoke to Peter by the till in the shop, **he** paid for the expensive ice cream that looked tasty.

d. **Object bias, Ambiguous**⁴⁵

After Mr. Smith spoke to Peter by the till in the shop, **he** paid for the expensive ice cream that looked tasty.

(Cunnings et al., 2016, p. 7, [6a–d])

In the unambiguous contexts (41a & 41c), the computer presented an image that depicts a male (Peter) and ice cream on the left vs. a female (Mrs. Jones) and a drink on the right. The L2ers should start looking at (the image of) Peter immediately after hearing the pronominal subject. In the ambiguous contexts (41b & 41d), the computer presented an image that depicts Peter and ice cream on the left vs. another male (Mr. Smith) and a drink on the right. If the L2ers resolve ambiguity in a native-like manner, they should start looking at Peter in (41b) and Mr. Smith in (41d) after hearing the pronominal subject because English pronouns preferentially take a subject antecedent; but in (41d) they should later revise their initial interpretation of the pronoun after hearing the “biasing noun” *ice cream*. But if they interpret the pronoun like the overt subject pronoun in their L1 Greek, then they should initially prefer the object as antecedent in both of the

⁴⁴ This condition is subject-biased because the computer screen displays an image of Peter and ice cream together to indicate that Peter paid for the ice cream.

⁴⁵ This condition is object-biased because the computer screen displays an image of Peter and ice cream together to indicate that Peter paid for the ice cream.

ambiguous conditions; this is to say, after hearing the pronominal subject, they should immediately start looking at Mr. Smith in (41b) and at Peter in (41d).

The results showed that in the unambiguous conditions, the L2ers and the English native controls were able to use the gender information, looking at the target referent upon hearing the subject pronoun; upon hearing the pronominal subject in the ambiguous conditions, the L2ers and the English natives preferentially looked at the entity denoted by the subject antecedent, regardless of whether they heard a sentence in the subject-bias or object-bias condition.⁴⁶ This replicates the extensively attested finding that English subject pronouns are used for highly accessible entities (i.e., for maintaining the current discourse topic). Whereas Roberts et al.'s L1-German and L1-Turkish L2ers of Dutch were not effectively guided by the accessibility information upon encountering an ambiguous pronoun (but see fn. 43), the L2ers in this study were able to use the accessibility information and exhibited an eye-gaze pattern qualitatively similar to English natives'. The finding thus challenges the IH.

The studies above show that in some cases even near-native speakers are different from native speakers in terms of their subject-RE interpretation, while others find L2ers' subject-RE interpretation to be qualitatively similar to that of native speakers. Why do we see such mixed conclusions? One reason is how the data are analyzed. Sorace and Filiaci (2006), for instance, compared their near-native L2ers' interpretation of overt-pronoun subjects against the Italian natives' and claimed that the difference in results (i.e., L2ers significantly more likely than natives to have a subject antecedent for the overt subject pronoun) indicates a problem of information integration. However, a within-group analysis of the near-native L2ers' data shows that they took an object antecedent at least numerically more often than a subject antecedent for the overt-pronoun subject, i.e., at rates of, respectively, 60% vs. 27%. Sorace and Filiaci did not statistically compare these rates, but if they are significantly different, then it would indicate that they do have an object-antecedent preference for the overt-pronoun subject—though their preference is not as strong as the natives'.

One reason for the weaker preference found in the L2ers may be because *the task* strained their processing resources. The picture-verification task used in Sorace and Filiaci (2006) and Belletti et al. (2007) were cognitively demanding in that the test sentences were bi-clausal

⁴⁶ Results from the eye-tracking data and the answers to the comprehension questions suggest that in condition (41d), i.e., the condition requiring reanalysis, the L2ers were less likely than the natives to revise their initial subject-antecedent interpretation to the object-antecedent interpretation. For details, see Cummings et al. (2016).

sentences with referentially ambiguous pronominal subjects and the participants had to evaluate three similar pictures against the possible meanings of each test sentence. If the source of L2ers' nonnative-like behavior at the syntax-discourse interface is their inability to fully integrate multiple sources of information online, then why should L2ers be tested on a complex task? To see their true potential to coordinate syntax and discourse/pragmatic information, researchers should *minimize* the processing cost required to complete a task.

For this reason, we employ, first, a simple self-paced reading task in which participants read sentences at their own pace and answer straightforward comprehension questions (Experiment 3), and, second, a simple picture-narration task in which participants look at sets of pictures with familiar Disney characters and narrate the stories depicted in them (Experiment 4). We examine whether L2ers can effectively and efficiently utilize information from a subject-RE to identify the intended referent in real-time comprehension, and/or whether they can choose a subject-RE form appropriate for a target discourse entity in production. If even non-near-native L2ers show subject-RE preferences that essentially parallel those of native participants, then the results would argue against the IH. We also endeavor to see whether L2 proficiency influences subject-RE processing, as Ellert (2013) found that this was a significant predictor of their L2ers' antecedent preferences.

5.1.2 Predictions for Experiment 3

Experiment 3 aims to investigate whether intermediate to advanced L2ers can use discourse information to calculate the accessibility of entities and show the expected subject-RE-form preferences during real-time comprehension of the TL. L2ers of English whose L1 is Chinese or Japanese are tested on the self-paced reading task used in Experiment 1A. The sample items in (18) for the two-entity context and (19) for the one-entity context are repeated here as (42) and (43).

- (42)
- | | | |
|----------|-----|---|
| | a. | Jane woke up Tom at 9 am this morning. |
| Continue | b. | She/Jane took off the blanket and said, "Wake up!" |
| Shift | b'. | He/Tom looked at the alarm and jumped out of bed. |
| | c. | Classes start at 9:30 am. |

- (43) a. Grace was in an ocean-view restaurant.
b. **She/Grace** had a very delicious steak there.
c. It was a fancy dinner.

There is a range of possible RT patterns for the L2ers' results, five of which are laid out below.

(i) Native-like processing of subject-REs

L2ers in the present study may be able to take discourse information into account during comprehension and show the same subject-RE preferences as the native English speakers tested in Experiment 1A. In the Continue condition (42b), then, the L2ers will read sentences with a pronominal subject significantly faster than those with a repeated-name subject (i.e., the RNP). In the Shift condition, sentences in the Repeated-Name condition will be processed faster than those in the Pronoun condition because the accessibility of the referent (e.g., TOM) is relatively low; however, since all items in the two-entity contexts have two gender-mismatching entities, (gender-marked) pronouns can clearly specify the intended referents and thus the RT difference between the two RE conditions will unlikely be significant. In the one-entity context (43), the L2ers will show a clear RNP; there is only one human protagonist in the context and a pronominal subject should be preferred for this extremely accessible entity.

(ii) Preference for more explicit subject-REs

If L2ers have this tendency, they will read sentences with a repeated-name subject faster than those with a pronominal subject in both the Continue and Shift conditions. Although the reading task is simple, the L2ers may still have difficulty building a native-like discourse representation due to their limited cognitive resources. Wilson et al. (2009) found that their L1-English L2ers of German overused the demonstrative subject—an RE form more explicit than a personal pronoun—and Ellert (2013) found a clear NP1-antecedent preference for the demonstrative subject in her lower-proficiency L1-Dutch L2ers of German. It may be that our L2ers will prefer a repeated-name subject over a pronominal subject.

(iii) Preference for more reduced subject-REs

If L2ers have this tendency, they will read sentences with a pronominal subject faster than those with a repeated-name subject in both the Continue and Shift conditions. Since pronouns contain less lexical information than proper names and their gender features can clearly specify the intended referents in our stimuli, it may be easier for L2ers to process pronominal subjects irrespective of the Transition conditions.

(iv) Influence from the L1 in the L2 processing of subject-REs

A fourth possibility is that L2ers may process subject-REs in ways that suggest mapping L1 forms to corresponding TL forms. Chinese and Japanese L2ers of English in the present study could, for instance, process English pronominal subjects like they process overt-pronoun subjects in their L1, and process repeated-name subjects in English like they process repeated-name subjects in their L1. In the residual-RT analyses, both Chinese and Japanese native speakers in Experiment 1 showed no RT difference between overt-pronoun and repeated-name subjects in the Continue condition but showed a shorter RT for repeated-name subjects in the Shift condition (preferred). But there was an important difference between the two groups in the analyses of raw RTs; Chinese speakers processed overt-pronoun subjects faster than repeated-name subjects in the Continue condition, whereas Japanese speakers did not show an RT difference here. These patterns may show up in the L2ers' RT results in English.

Alternatively, L2ers may map L1 subject-REs onto those in English in terms of relative explicitness, such that they process English pronominal subjects like Chinese/Japanese null subjects (the least explicit forms in the languages), and they process repeated-name subjects in English like they process those in their L1. In the residual-RT analysis, native Chinese speakers showed no clear difference between null and repeated-name subjects in the Continue condition but a clear dispreference of null subjects in the Shift condition; no clear subject-RE preference was found in the raw-RT analysis. As for native Japanese speakers, both the residual- and raw-RT analyses indicated that they strongly preferred null subjects over repeated-name subjects in the Continue condition, though there was no clear preference in the Shift condition.

(v) No subject-RE preference

A fifth possibility is that L2ers may fail to show any preference for particular subject-REs. In the present study, this would be realized as L1-Chinese and/or L1-Japanese L2ers evincing no RT difference between the Pronoun and Repeated-Name conditions in either the Continue or Shift conditions. This (least interesting) outcome could be obtained for several reasons. When comprehending a sentence in their TL, L2ers will be able to extract the message and build a semantic representation (as indicated by high scores on comprehension questions), but they may not have sufficient processing resources to associate a given subject-RE form to a particular accessibility level of the referent. It is also possible that the sentence-by-sentence self-paced reading task and/or the reading stimuli are not appropriate to test their RE preferences during comprehension. Although participants are told to read sentences as fast as possible, they can still decide their own speed of reading. Unlike in a region-by-region reading task, participants in a sentence-by-sentence reading task can see the whole sentence all at once, so they can go back and forth between words if they want to. Moreover, participants need to create a representation of entities that do not exist, and the pairs of entities in the two-entity context are semantically similar (i.e., both humans, rather than, e.g., different types of animals). It may be challenging for L2ers to establish referents clearly and (when the entities have the same gender) distinctively in their discourse representations. For reasons like these, L2ers' subject-RE preferences may not be observed in the data.

Experiment 3 below will examine whether Chinese and Japanese L2ers of English show subject-RE preferences in the self-paced reading task, and if so, which form they prefer.

5.2 Experiment 3: Chinese and Japanese L2ers of English

5.2.1 Participants

A total of 64 native Mandarin-Chinese L2ers of English and 69 native Japanese L2ers of English participated in this experiment. At the time of the experiment, of the 64 L1-Chinese L2ers, three were studying at a university on the mainland of the U.S. and the rest at the University of Hawaii. All L1-Japanese L2ers were studying at the University of Hawaii or in a language school affiliated with the university. The university-level L2ers were specializing in various academic subjects, and those at the language school were studying English in high-intermediate-to-advanced-level courses. All of the participants started learning English at

the age of 10 or later, and none of them had a native English speaker in their family. They had English proficiency equivalent to a score of 500 or higher on the paper-based TOEFL, but they took the C-test developed by Schulz (2006) during the experiment (see Appendix B). From the mean scores and the ranges in Table 5.1, and from the fact that they were international students officially admitted to a university, it can be said that the two L2 groups were intermediate to advanced levels at the time of the experiment. The two groups were more or less comparable in terms of their proficiency.

Table 5.1. Results of the C-test for the L2ers and native English speakers

Group	<i>n</i>	C-test scores (max = 60)		
		<i>M</i>	<i>SD</i>	Range
Native English speakers (Experiment 1A)	40	47.0	6.6	35 – 59
Chinese L2ers of English	64	30.6	7.1	13 – 53
Japanese L2ers of English	69	26.4	7.7	14 – 48

The participants were recruited through mailing lists, advertisement flyers posted in classrooms, and the instructors of their mandatory ESL courses. They received either a gift card or course credit as compensation.

5.2.2 *Materials and procedure*

The participants read passages like (42) and (43) above in the same self-paced reading task as in Experiment 1A (see Chapter 3 for details). The L2ers who were enrolled in the language school were tested individually in an empty classroom and the others were tested individually in experimental labs at the two universities. They took about 35 minutes to finish the C-test and the reading task.

5.2.3 *Preparation for data analysis*

The collected data were trimmed and converted into residual log RTs in the same steps as in Experiment 1A (see Chapter 3).

Chinese L2ers of English

All participants and items had 66% or higher comprehension accuracy, so none of them was excluded at Step 1 (the cut-off point was 50%). The next step excluded the RTs from the trials whose comprehension questions were answered incorrectly. This removed 5.1% of the data. The RTs shorter than 500 ms, or longer than the 3 standard deviations above the mean across all RTs in the group, were excluded as extreme outliers, which accounted for 1.9% of the data. The remaining RTs were converted into log RTs. A replacement of RTs beyond each participant's mean plus or minus 2.5 standard deviations with the cutoff value was applied, but no RT was affected. A linear regression model calculated with the `lm()` function in R indicated that sentence length was a significant predictor ($b = .872$, $t = 24.900$, $p < .001$). The log RTs were thus residualized. The Q-Q plot and the plot for checking homoscedasticity are available in Appendices C and D.

Japanese L2ers of English

None of the participants or items was excluded based on the criterion of Step 1 (individual comprehension accuracy was 82% or higher), but 5.8% of the data were excluded at Step 2 due to incorrect answers to the comprehension questions. Then extreme outliers were excluded, which accounted for 1.3% of the data. The remaining RTs were converted into log RTs, and no RT was replaced with each participant's mean plus or minus 2.5 standard deviations. The effect of sentence length was significant in this L2 group as well ($b = .904$, $t = 31.52$, $p < .001$). The log RTs were converted into residual log RTs. The Q-Q plot and the plot for checking homoscedasticity are available in Appendices C and D.

5.2.4 Results

The comprehension accuracy in the L1-Chinese L2ers before data trimming was 94.9% for all items, 94.2% for the critical items, and 95.7% for the filler items; the accuracy in the L1-Japanese L2ers was 94.2% for all items, 93.9% for the critical items, and 94.6% for the filler items. Hence, both L2 groups attended very well to the task. For the RT analysis, mixed-effects linear regression models were used with RE (Pronoun vs. Repeated Name), Transition (Continue vs. Shift), Proficiency (C-test scores), and Item List (Lists 1–4 vs. Lists 5–8) as fixed effects and

with Participant and Item as random effects. The RT results in the two-entity context will be presented separately from those in the one-entity context.

Two-entity context

The statistical analyses first examined the effect of Item List on the RTs. For the L1-Chinese L2ers, there was no main effect of Item List ($b = -.001, t = -.037, p = .970$), interaction of Item List with RE ($b = .015, t = .406, p = .686$) or interaction of Item List with Transition ($b = .031, t = .798, p = .435$). Similarly for the L1-Japanese L2ers, there was neither a main effect of Item list ($b = .025, t = 1.402, p = .175$), an interaction of Item List with RE ($b = .037, t = 1.119, p = .271$), nor an interaction of Item List with Transition ($b = -.029, t = -.875, p = .386$). The predictor Item List is removed from subsequent analyses.

Next, the predictor Group was added to the model as a fixed effect in order to compare the RT patterns in the L1-Chinese L2ers, the L1-Japanese L2ers, and the native English speakers from Experiment 1. However, the models generally did not converge or produce interpretable results. Thus, inferential statistics on group comparisons will not be reported here.

Figures 5.1 and 5.2 and Table 5.2 show the RT results from the L1-Chinese L2ers. In the statistics tables, “*” indicates a significant effect at the $< .05$ level and “**” at the $< .01$ level.

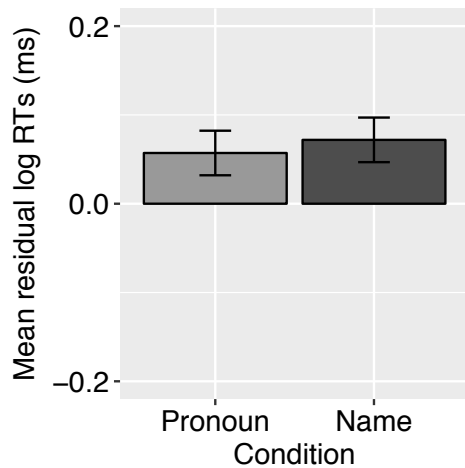


Figure 5.1. Mean residual log RTs for the Continue condition (L1-Chinese L2ers)

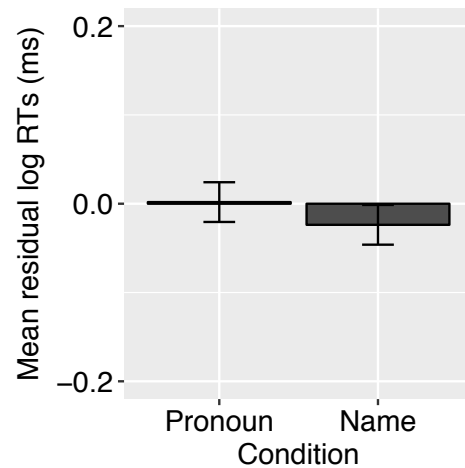


Figure 5.2. Mean residual log RTs for the Shift condition (L1-Chinese L2ers)

Table 5.2. Residual RT results for the two-entity context (L1-Chinese L2ers)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
RE	−.008	.018	−.440	.660
Transition	−.077	.018	−4.341	< .001 **
Proficiency	.002	.052	.047	.962
RE × Transition	−.029	.035	−.831	.406
RE × Proficiency	−.140	.104	−1.350	.177
Transition × Proficiency	.061	.104	.583	.560
RE × Transition × Proficiency	.152	.208	.731	.465

There was a significant main effect of Transition ($p < .001$), indicating that the L1-Chinese L2ers read sentences in the Shift condition faster than those in the Continue condition. One possible reason is that since the stimuli in the Continue and Shift conditions differed greatly (see, e.g., [42]), the differences in syntactic structure and vocabulary may have caused the RT difference between the two conditions. Given the lack of a similar effect of Transition in the residual RT analysis for the native English speakers in Experiment 1A, the L2ers seem to have a tendency to prefer a shifted discourse center/topic. But even if the entities encoded in object position of the context sentence are relatively more accessible than those in subject position when L1-Chinese L2ers started reading the critical sentences, they nevertheless did not prefer one subject-RE form over the other. There were no other significant effects or interactions of the predictors on the RTs.

In the analysis of raw RTs—Figures 5.3 & 5.4 and Table 5.3—there was a significant main effect of Proficiency ($p = .005$), but no other significant effects or interactions were found.

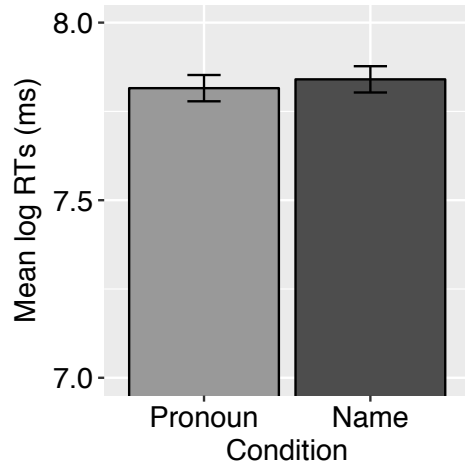


Figure 5.3. Mean log RTs for the Continue condition (L1-Chinese L2ers)

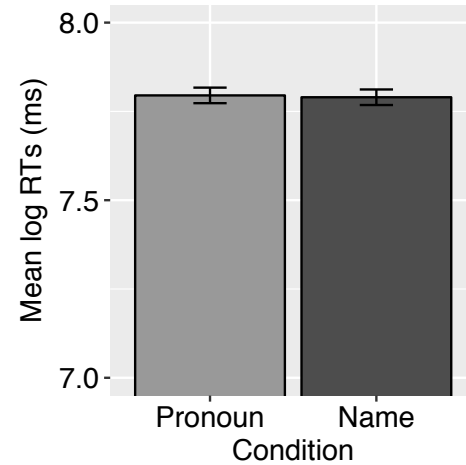


Figure 5.4. Mean log RTs for the Shift condition (L1-Chinese L2ers)

Table 5.3. Raw RT results for the two-entity context (L1-Chinese L2ers)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
RE	.013	.020	.626	.536
Transition	−.039	.062	−.628	.538
Proficiency	−.545	.189	−2.890	.005 **
RE × Transition	−.043	.039	−1.080	.292
RE × Proficiency	−.114	.103	−1.097	.273
Transition × Proficiency	.074	.104	.714	.476
RE × Transition × Proficiency	.105	.208	.508	.613

Note that a main effect of Proficiency was found in the raw-RT analysis but not in the residual-RT analysis. This is most likely because individual differences in RTs were reduced during the process of RT conversion. The conversion method used in the present study first calculates a best-fitted regression equation (for predicted RTs) for *each participant* using the model in (23) and then subtracts the predicted RTs from raw RTs. The equations for faster readers (more advanced L2ers) had lower intercepts than those for slower readers (less advanced L2ers) did, but these differences were not reflected in the residual RTs. If one obtains residual RTs by calculating a single equation for all participants using sentence length as a predictor, then the effect of Proficiency would more likely be observed in the residual-RT analysis as well.

The four plots in Figure 5.5 show the distribution of raw log RTs along the L1-Chinese L2ers' C-test scores. The x-axis shows C-test scores (max = 60 points) and the y-axis shows raw log RTs from 6.5 log-ms to 9 log-ms, which correspond to 665 ms to 8100 ms in linear, non-log RTs.⁴⁷ The trend lines indicate that in each experimental condition, participants with higher English proficiency processed sentences faster than those with lower proficiency. However, since Proficiency did not interact with RE or Transition, it cannot be said that more proficient L2ers were better at associating the degrees of accessibility with RE forms. Neither the residual RTs nor the raw RTs indicated subject-RE preferences for the L1-Chinese L2ers.

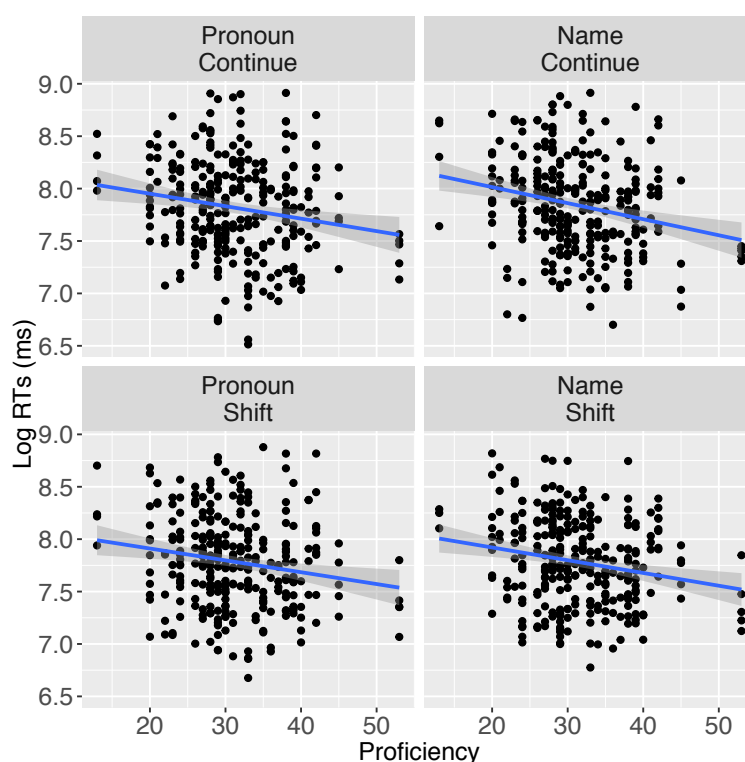


Figure 5.5. Raw RTs in the two-entity context plotted along C-test scores (L1-Chinese L2ers)

We now turn to the results from the L1-Japanese L2ers. The residual RT analysis (Figures 5.6 & 5.7 and Table 5.4) found a significant main effect of Transition but no other significant effects.

⁴⁷ Although RTs beyond each participant's mean plus or minus 2.5SD were not included, there were still long RTs in the data. Future analyses can use a stricter criterion for outliers.

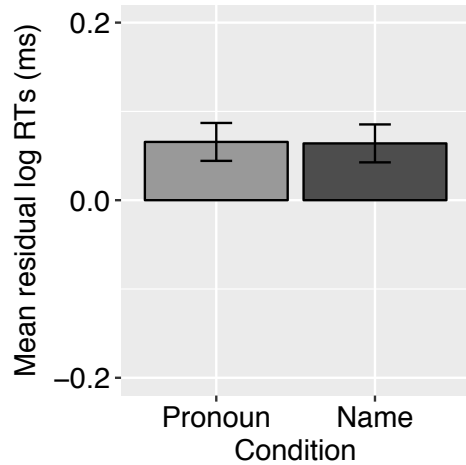


Figure 5.6. Mean residual log RTs for the Continue condition (L1-Japanese L2ers)

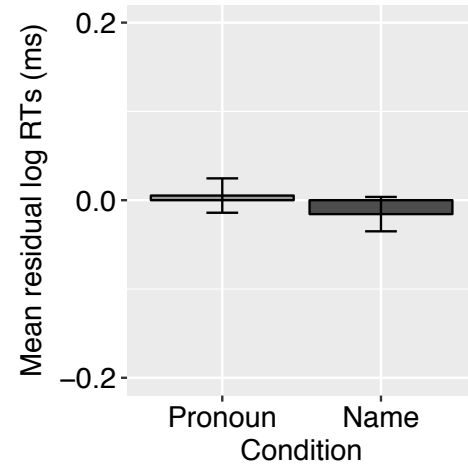


Figure 5.7. Mean residual log RTs for the Shift condition (L1-Japanese L2ers)

Table 5.4. Residual RT results for the two-entity context (L1-Japanese L2ers)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
RE	-.013	.017	-.739	.466
Transition	-.075	.029	-2.590	.016 **
Proficiency	-.060	.033	-1.835	.068
RE × Transition	-.026	.034	-.766	.452
RE × Proficiency	.019	.068	.280	.780
Transition × Proficiency	-.004	.081	-.045	.964
RE × Transition × Proficiency	-.221	.133	-1.661	.099

The results indicate that, like the L1-Chinese L2ers, the L1-Japanese L2ers read sentences in the Shift condition faster than those in the Continue condition. However, the RT facilitation in the Shift condition did not lead to a preference of a subject-RE form.

The raw RT analysis (Figures 5.8 & 5.9 and Table 5.5) indicated that as in the L1-Chinese L2 group, the main effect of Proficiency was significant in the L1-Japanese L2 group ($p < .001$).

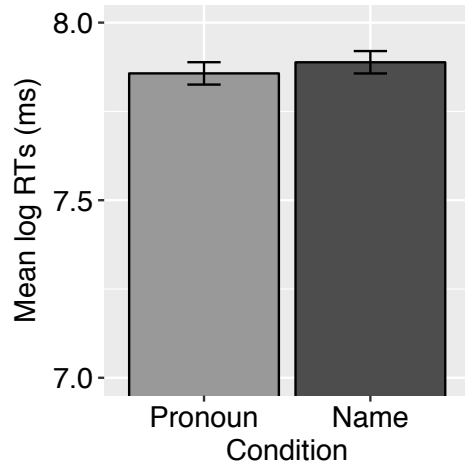


Figure 5.8. Mean log RTs for the Continue condition (L1-Japanese L2ers)

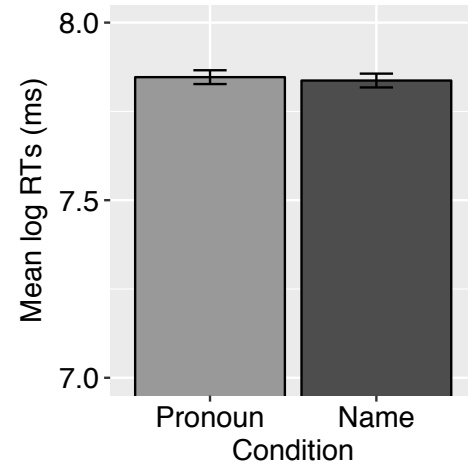


Figure 5.9. Mean log RTs for the Shift condition (L1-Japanese L2ers)

Table 5.5. Raw RT results for the two-entity context (L1-Japanese L2ers)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
RE	.017	.018	.954	.347
Transition	−.027	.061	−.445	.661
Proficiency	−.515	.114	−4.522	< .001 **
RE × Transition	−.039	.035	−1.124	.276
RE × Proficiency	.026	.069	.371	.711
Transition × Proficiency	−.020	.081	−.251	.803
RE × Transition × Proficiency	−.152	.138	−1.100	.444

The raw log RTs plotted along the participants' C-test scores in Figure 5.10 show that the more proficient L2ers processed sentences faster than the less proficient L2ers. No other main effect or interaction was found. Neither the residual RT analysis nor the raw RT analysis found subject-RE preferences for L1-Japanese L2ers.

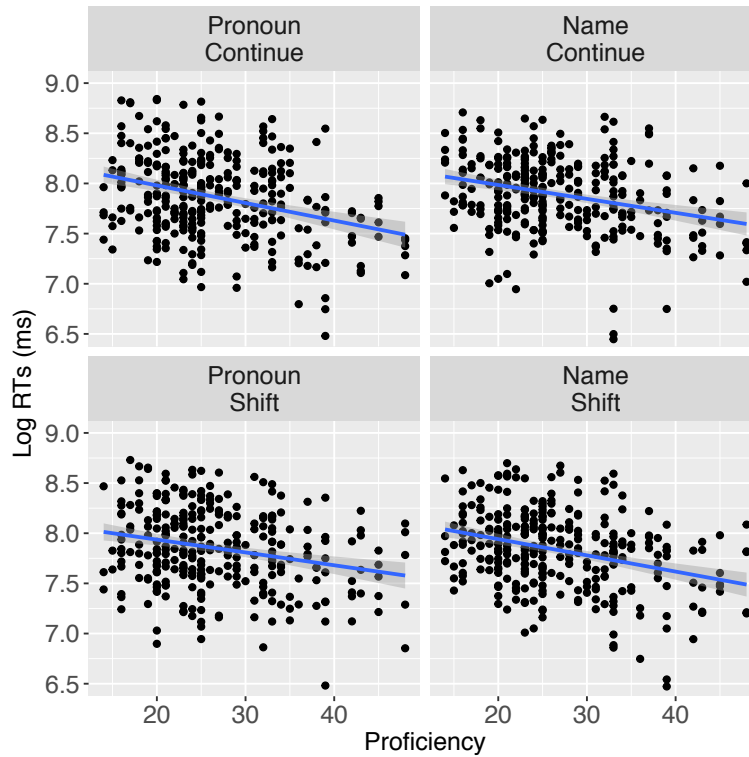


Figure 5.10. Raw RTs in the two-entity context plotted along C-test scores (L1-Japanese L2ers)

One-entity context

Next, the RT data obtained from the one-entity context were examined. Since the discourses in this context are simpler than those in the two-entity context, and since the sole entity in a discourse is assumed to be highly salient and accessible, the L2ers' RE preferences were expected to emerge. However, the residual RT analysis did not show any significant RT difference in the L1-Chinese L2ers (Figure 5.11 and Table 5.6). The raw RT analysis (Figure 5.12 and Table 5.7) found a significant main effect of Proficiency.

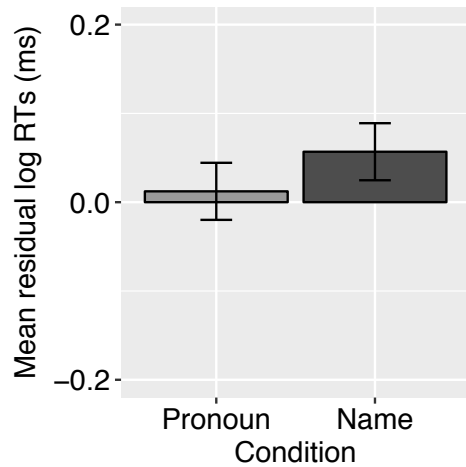


Figure 5.11. Mean residual log RTs for the one-entity context (L1-Chinese L2ers)

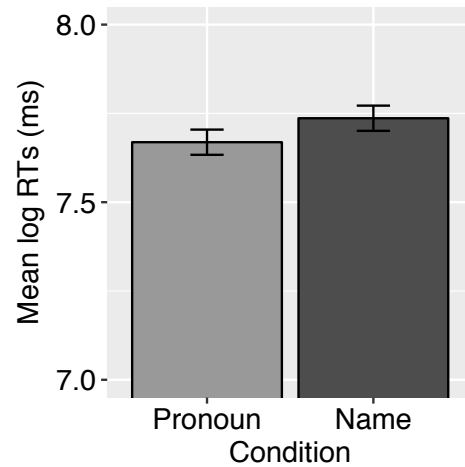


Figure 5.12. Mean log RTs for the one-entity context (L1-Chinese L2ers)

Table 5.6. Residual RT results for the one-entity context (L1-Chinese L2ers)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
RE	.038	.037	1.030	.322
Proficiency	-.113	.085	-1.329	.199
RE × Proficiency	.016	.200	.081	.937

Table 5.7. Raw RT results for the one-entity context (L1-Chinese L2ers)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
RE	.062	.037	1.659	.125
Proficiency	-.648	.205	-3.162	.002 **
RE × Proficiency	-.043	.186	-.233	.819

The plots in Figure 5.13 show negative relationships between the L1-Chinese L2ers' C-test scores and RTs. It is not surprising that more proficient L2ers process sentences faster than less proficient L2ers.

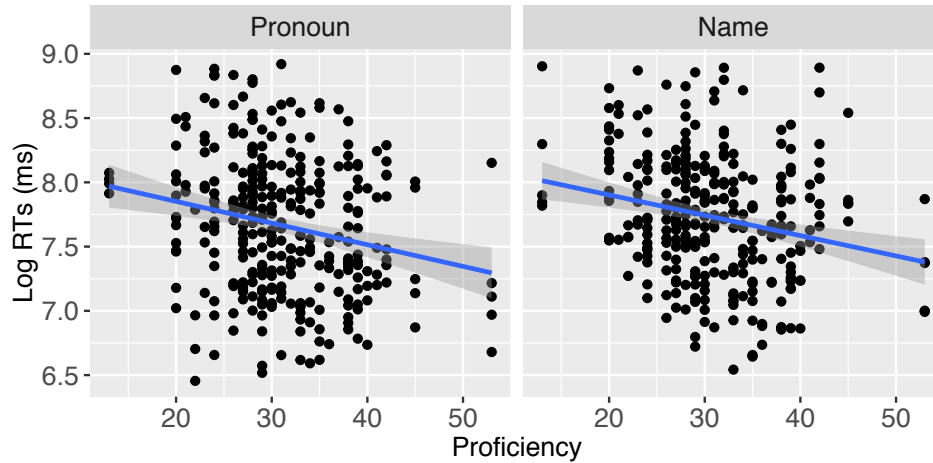


Figure 5.13. Raw RTs in the one-entity context plotted along C-test scores (L1-Chinese L2ers)

Although the manipulation of discourse conditions did not yield any significant RT differences in the one-entity context, the data indicate that the L1-Chinese L2ers' RTs are going in the expected direction; they processed sentences with a pronominal subject numerically faster than those with a repeated-name subject. They might have treated the two types of subject-REs differently, but the effect was too subtle to detect statistically.

The results from the L1-Japanese L2ers in the one-entity context are shown in Figures 5.14 and 5.15 and Tables 5.8 and 5.9.

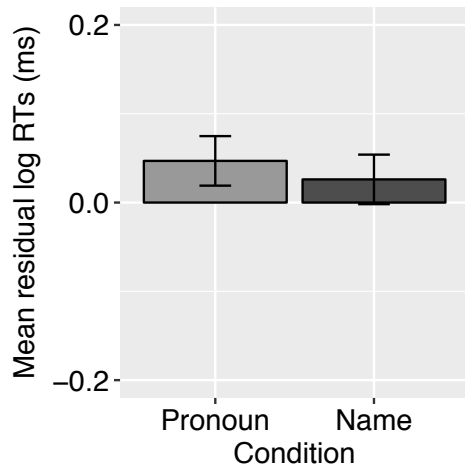


Figure 5.14. Mean residual log RTs for the one-entity context (L1-Japanese L2ers)

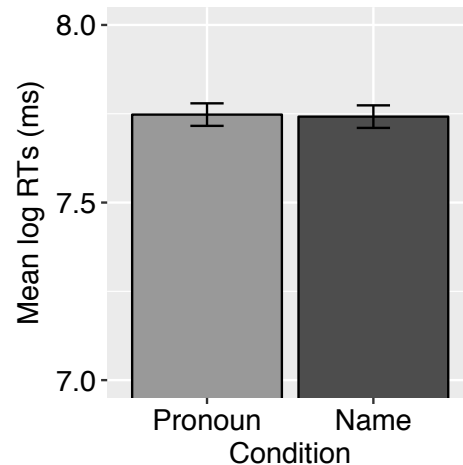


Figure 5.15. Mean log RTs for the one-entity context (L1-Japanese L2ers)

Table 5.8. Residual RT results for the one-entity context (L1-Japanese L2ers)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
RE	−.024	.023	−1.069	.294
Proficiency	.048	.055	.862	.403
RE × Proficiency	.066	.108	.611	.551

Table 5.9. Raw RT results for the one-entity context (L1-Japanese L2ers)

	<i>b</i>	SE	<i>t</i>	<i>p</i>
RE	.002	.029	.063	.950
Proficiency	−.427	.121	−3.528	.001 **
RE × Proficiency	.048	.135	.355	.727

Like the L1-Chinese L2ers, the L1-Japanese L2ers did not show any subject-RE preference here. There was a significant effect of Proficiency in the analysis of raw RTs.

Figure 5.16, plotting L1-Japanese L2ers' C-test scores against their RTs, indicates that more proficient L2ers process sentences faster than less proficient L2ers do, but the lack of an interaction with RE suggests that regardless of their proficiency levels, the L2ers processed the discourses in the two subject-RE conditions similarly.

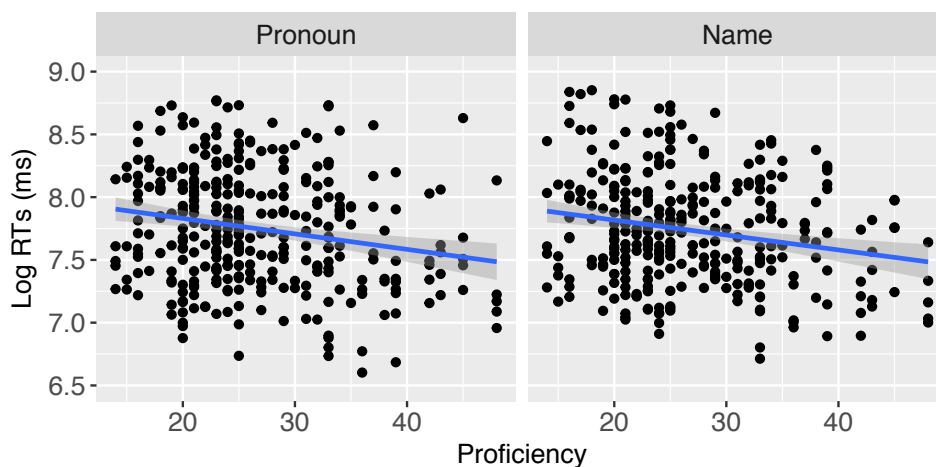


Figure 5.16. Raw RTs in the one-entity context plotted along C-test scores (L1-Japanese L2ers)

5.3 Discussion

Experiment 3 looked at how native Chinese-speaking and Japanese-speaking L2ers of English comprehend a pronominal vs. repeated-name subject for a continued vs. shifted discourse center in real time. There were five possible patterns in the RT outcomes: (i) The L2ers will show native-like subject-RE processing, evincing the RNP (Gordon et al., 1993); (ii) The discourse entities in the L2ers' representations are generally not so accessible because of their limited cognitive resources; the L2ers will prefer an explicit subject-RE in both Transition conditions since the information in the RE will help them identify the intended referent; (iii) The L2ers will prefer a reduced form of subject-REs because they want to avoid costly processing; (iv) The L2ers will show L1 influence in the processing of subject-REs, treating English pronouns like the null or overt pronouns in their L1; and (v) The L2ers will not show subject-RE form preferences because, for instance, they fail to establish discourse entities clearly and distinctively, and/or fail to correlate referent accessibility with a particular RE form.

The reading materials used to test native English speakers in Experiment 1A were used here to test intermediate to advanced native Chinese- and Japanese-speaking L2ers of English. The RT results from the residual log RTs and the raw log RTs showed no statistically significant subject-RE preferences in the L2ers, although the residual RTs in the Shift condition were significantly *shorter* than those in the Continue condition in both L2 groups (the main effect of Transition) and the raw RTs for proficient L2ers were shorter than those for less proficient L2ers (the main effect of Proficiency). The results are consistent with pattern (v).

For the effect of Transition, it might be that the residual RTs were shorter in the Shift condition because the stimuli in that condition were simply easier to process than those in the Continue condition. The vocabulary, sentence structure, and propositions expressed in the stimuli were very different between the conditions, and this might have somehow contributed to the significant effect. Another possibility is that the RTs in the Continue condition increased because the L2ers expected a null subject (or did not expect an overtly expressed subject) but that expectation went unfulfilled. In Experiment 1C, both the residual and raw RTs indicated native Japanese speakers' clear preference for a null-pronoun subject over both overt-pronoun and repeated-name subjects in the Continue condition. If this RE preference influenced L1-Japanese L2ers' processing of English sentences, they would have been surprised because they did not get a null subject (such a surprise did not occur in the Shift condition because they did not

prefer/expect it); this surprise might have increased the RT in the Continue condition and made it less different from the RT in the Shift condition. However, this account does not explain why the L2ers did not show a clear preference for a repeated-name subject in the Shift condition (a clear repeated-name preference was found in native Japanese speakers) or why overall the L1-Chinese L2ers patterned similarly to the L1-Japanese L2ers (the Chinese and Japanese native speakers patterned very differently in Experiment 1). A third possibility for the Transition effect is that the L2ers expected the critical sentence in the discourse to continue the story about the last entity that they encountered in the context sentence (i.e., recency). When they started comprehending the critical sentence, the most recently encountered entity—the one encoded in the object position of the context sentence—was active in their mind and so the following critical sentence that mentioned the referent might have been easier to process. However, even in this condition they still did not show a difference between pronominal and repeated-name subjects.

As for the lack of the RE effect, the L2ers might not have fully established entities in their discourse representations. It may be that although they were able to comprehend who did what to whom in the discourses, there was not much accessibility difference among the entities. The L2ers saw names like *Tom* and *Jane* in the stimuli, but it might have been difficult for them to clearly establish the mental representations of the referents in the absence of any identifying or individuating material on these hypothetical people named *Tom* and *Jane*. If such features of referents were missing in their mind, the L2ers should have had problems calculating the referents' accessibility. If the accessibility was more or less the same for the two discourse entities in question, the L2ers would not have a preference for one RE form over another.

Recall that in their comprehension study, Cunnings et al. (2016) used a visual-world eye-tracking task in which images of the discourse entities (e.g., PETER, MRS. JONES, MR. SMITH) were presented on the computer screen. Even though the entities were hypothetical people, the L2ers seemed to be able to establish representations of them with the aid of those images. The picture-narration task used in Experiment 2 will thus be useful for ascertaining whether the L2ers can show clear subject-RE form preferences in English if they have specific entities represented in their mind. Four of the most famous Disney characters—Mickey, Minnie, Donald, and Daisy—should be (very) familiar to them, and the pictures in the stimuli, moreover, depict these entities (over and over). It should thus be easier for them to create/elaborate the representations

of those entities than to create the representations of entities virtually only through names, like *Tom* and *Jane*. We will examine this possibility in the next chapter.

CHAPTER 6

EXPERIMENT 4: L2 PRODUCTION OF REFERENTIAL EXPRESSIONS

6.1 Introduction

This experiment examines the production of referential expressions (REs), either pronominal or repeated-name subjects, in discourse by L2 learners (L2ers) of English whose native language (L1) is Chinese or Japanese. In Experiment 2, native speakers of English, Chinese, and Japanese narrated the stories depicted in series of pictures. Table 6.1 summarizes the types of test conditions comprising this task, the types of entities depicted in each of the first two pictures, and the type of target entity (performing some action) that participants are asked to talk about in Picture 2.

Table 6.1. A sample item of discourse conditions in Experiment 4

Condition	Picture 1	Picture 2	Target entity
One entity	Minnie	Minnie	Minnie
Two entities, GMM, Continue	Minnie & Donald	Minnie & Donald	Minnie
Two→One entities, GMM, Continue	Minnie & Donald	Minnie	Minnie
Two entities, GM, Continue	Minnie & Daisy	Minnie & Daisy	Minnie
Two→One entities, GM, Continue	Minnie & Daisy	Minnie	Minnie
Two entities, GMM, Shift	Minnie & Donald	Minnie & Donald	Donald
Two→One entities, GMM, Shift	Minnie & Donald	Donald	Donald

GMM = gender mismatch, GM = gender match

Continue = Topic maintenance, Shift = Topic shift

A sample of the pictures for each condition of this experiment is presented in (44), repeating (31) in Chapter 4.

(44) *Last weekend, Minnie went hiking (with Donald).*

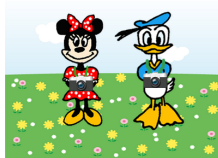
And then, ____.

A butterfly ____.

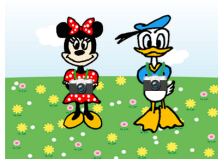
a. One-Entity condition



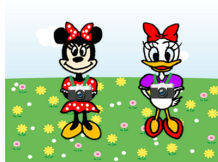
b. Two-Entity Gender-Mismatched (GMM) Continue condition



c. Two→One-Entity GMM Continue condition



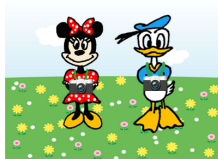
d. Two-Entity Gender-Matched (GM) Continue condition



e. Two→One-Entity GM Continue condition



f. Two-Entity GMM Shift condition



g. Two→One-Entity GMM Shift condition



In Experiment 2A, recall that, first, native English speakers produced a repeated-name subject less often in the One-Entity condition than in the Two-Entity and Two→One-Entity GMM Continue conditions, replicating Arnold and Griffin (2007). According to those authors, discourses with two entities elicit more repeated-name subjects than pronominal subjects because the presence of an additional entity decreases the accessibility of (the representation of) the target entity and this requires a more explicit RE form. Second, the participants in Experiment 2A produced more repeated-name subjects in the gender-matched (GM) Continue conditions than in the gender-mismatched (GMM) Continue conditions. This is likely to be avoidance of referential ambiguity; repeated names, but not pronouns, can distinguish the two entities in the discourse. Lastly, the participants produced more repeated-name subjects in the GMM Shift conditions than in the GMM Continue conditions. Our interpretation of this was that since the target entity was initially denoted by an NP in a syntactically less prominent position (i.e., a prepositional object), its discourse accessibility was relatively low, resulting in the frequent production of the more explicit RE.

Experiment 4 investigates whether the same L1-Chinese and L1-Japanese L2ers of English tested in Experiment 3 show similar RE-production patterns. In the Discussion of Chapter 5, one possibility we articulated was that neither of the L2 groups tested in Experiment 3 would show a clear subject-RE preference in the reading task, but in production, they might do so, first, because the discourse entities used in this experiment must be (very) familiar to the L2ers and, second, because the pictures depicting those entities would help the L2ers establish the mental representations of them. A recent study that examined advanced L2ers' subject-RE production suggests that they were indeed capable of using discourse information when producing the REs.

Contemori and Dussias (2016) tested advanced L1-Spanish L2ers of English and native English speakers on the materials that Arnold and Griffin (2007) developed. The participants saw pictures in discourse conditions equivalent to our One-Entity condition (44a), Two-Entity GMM Continue condition (44b), Two→One-Entity GMM Continue condition (44c), and Two-Entity GM Continue condition (44d). Contemori and Dussias reported that results of the native English speakers replicated those of Arnold and Griffin: They produced a repeated-name subject more frequently in the discourses with two entities than in the One-Entity condition, and also more

frequently in the GM condition than in the GMM conditions.⁴⁸ The authors did not statistically compare the proportions of pronominal subjects between the Two-Entity and Two→One-Entity conditions, but the results figure does not indicate a large difference between the two conditions.

When the native speakers' data were compared with the L2ers' data, there was a main effect of Group, indicating that overall, the L2ers produced repeated-name subjects less frequently than the native speakers did. However, this Group factor did not interact with Condition, which suggests that even though the L2ers had a lower rate of repeated-name subjects, their subject-RE production was context-dependent; they still produced a repeated-name subject more often in the conditions with two entities than in the One-Entity condition, and more often in the GM condition than in the GMM conditions. Thus, the results from the two groups were qualitatively similar, although they were quantitatively different.

As for the L2ers' production of fewer repeated-name subjects, Contemori and Dussias took it as evidence for their avoidance of costly processing. The authors explain the results in the framework of the Asymmetric Grammar Hypothesis (e.g., Hendricks, Englert, Wubs, & Hoeks, 2008). This hypothesis takes an Optimality Theoretic approach to grammar and discourse processing, and claims that the speaker first selects a pronoun for a discourse topic because it is the optimal RE form, satisfying more relevant constraints than a repeated name. But the speaker subsequently evaluates whether the hearer can identify the intended referent with the information from the RE; if he/she thinks that the use of a pronoun misleads the hearer, he/she discards the option and produces a repeated name. According to Hendriks, Koster, and Hoeks (2014), for instance, the second step requires additional cognitive resources because the speaker must consider the hearer's perspective, and, moreover, going through two steps is more complex and time-consuming than going through only one. Thus, the Asymmetric Grammar Hypothesis predicts that a speaker would produce a pronominal subject under cognitive pressure. Following this, Contemori and Dussias (2016) claimed that the L2 speakers produced pronominal subjects as the default form (see, e.g., Sorace, 2011) because L2ers are less efficient in processing than native speakers are, and the process of choosing an RE form may itself be associated with an increase in processing cost.

⁴⁸ Note that although the authors say their participants produced significantly more repeated-name subjects in the GM condition than in the GMM condition, the error bars for these conditions overlap considerably.

However, it is not clear how Contemori and Dussias would explain the L2ers' (and the native English speakers') higher rates of production of repeated-name subjects in the Two-Entity GMM and Two→One-Entity GMM conditions than in the One-Entity condition. In these conditions, the Asymmetric Grammar Hypothesis would predict similar (if not greater) proportions of pronominal subjects because this RE form (which, recall, is the supposed default) can clearly specify the intended referents and will not misguide the hearer in his/her referent identification process. Thus, Contemori and Dussias' data cannot be fully explained by a single account. It is not yet clear why their L1-Spanish L2ers produced fewer repeated-name subjects, but there does seem to be such a tendency. Importantly, however, since Contemori and Dussias tested only one group of L2ers, the results cannot answer the question of whether the use of fewer repeated-name subjects is an effect found in any L2 group or whether it is due to some property of their L1 Spanish.

In contrast to the L2 results from the above picture-narration study, discourse analysis studies have reported an overuse of explicit REs. Blackwell and Quesada (2012) compared story-telling data from beginning-to-advanced L2ers of Spanish and Spanish native speakers. They found that for entities in the *in-focus* cognitive status of Gundel et al.'s (1993) Givenness Hierarchy (see Chapter 2), the natives produced null pronouns 90% of the time and the L2ers at all proficiency levels (beginning, intermediate, advanced) did so less frequently, only 61%–65% of the time. Nakahama's (2009) story-telling data similarly show that Japanese native speakers overwhelmingly used null-pronoun subjects for continued discourse topics (90%), but low-proficient L1-English and L1-Korean L2ers of Japanese produced the null form at significantly lower rates (60%–70%); instead, they used topic-marked repeated NPs (23%–36%). The last case is interesting in that even though native speakers of both Japanese and Korean use null subjects for continued discourse topics, low-proficient L1-Korean L2ers of Japanese are likely to overuse an explicit form of subject.⁴⁹

These studies above point to a rather complicated picture. On the one hand, (advanced) L2ers are sensitive to discourse features (e.g., the number of entities in the discourse, gender congruence between two discourse entities) and choose appropriate RE forms; but on the other hand, they produce fewer repeated-name subjects than English natives do in picture narration and

⁴⁹ Although the English-speaking and Korean-speaking L2ers did not show significant differences in the use of null pronouns, the rate of null-pronoun production, at all proficiency levels, was numerically higher in the L1-Korean L2ers than in the L1-English L2ers.

produce explicit forms more frequently than natives do in spontaneous story-telling. Given this seemingly discrepant backdrop, it should be of interest to see if our intermediate-to-advanced L1-Chinese and L1-Japanese L2ers perform similarly to Contemori and Dussias' advanced L1-Spanish L2ers in a very similar picture-narration task, or if they tend to produce repeated-name subjects more frequently than native English speakers. The performance of the two L1-based L2 groups will be compared with that of both the native English group from Experiment 2A as well as each other, and we will also explore how their proficiency in English influences their RE-production patterns.

The possible subject-RE production patterns in the present experiment are as follows.

(i) Native-like production of subject-REs

Although the L2 participants in this study are certainly nonnative-like in terms of their C-test scores and the (null) results in Experiment 3 (reading task), they may still be able to exhibit native-like patterns in this production task. They are expected to be (very) familiar with the discourse entities (i.e., universally well-known Disney characters) in the task, and the discourse contexts are provided not only linguistically but also visually (i.e., with the description sentence accompanying the image in Picture 1). It should be easier in the current experiment than in the reading experiment for the L2ers to construct detailed discourse representations.

(ii) Preference for more explicit subject-REs

A second possibility is that the L2ers may rely on a more explicit subject-RE (i.e., a repeated-name) in all discourse conditions because their cognitive resources are limited (e.g., McDonald, 2006; Segalowitz, 2003). If one adopts Arnold and Griffin's approach or if the discourse analysis studies above are indicative, the L2ers who have difficulty integrating discourse information should predominantly produce repeated-name subjects. Additionally, lower-proficient L2ers would be predicted to produce more repeated-name subjects than higher-proficient L2ers because of the extent of cognitive burden they would experience.

(iii) Preference for more reduced subject-REs

The L2ers may rely on a reduced subject-RE (i.e., a pronoun) because they want to avoid costly processing. As mentioned above, Contemori and Dussias (2016) found that overall their

L1-Spanish L2ers of English produced fewer repeated-name subjects than did the native English speakers. They argued that this was due to the L2ers' strategy to avoid extra processing cost in the process of selecting an RE form.⁵⁰

(iv) Influence from the L1 in the L2 production of subject-REs

The L2ers may show L1 influence—predominantly producing a pronominal subject (corresponding to a null-pronoun subject in their Chinese/Japanese L1) in the One-Entity condition and a repeated-name subject in all conditions with two entities—just like native Chinese and Japanese speakers in Experiments 2B and 2C did.

(v) No subject-RE preference

Lastly, if the L2ers are unable to calculate discourse accessibility or correlate accessibility with particular RE forms, they may not show any differences in subject-RE production across the discourse conditions. This pattern follows the results of Experiment 3.

6.2 Experiment 4: L1-Chinese and L1-Japanese L2ers of English

6.2.1 Participants

The L2ers who participated in Experiment 3 ($n = 64$ for the Chinese group, $n = 69$ for the Japanese group) also participated in this experiment (see Chapter 5). However, the data from one L1-Japanese L2er were discarded because of loss due to technical problems during the experiment.

6.2.2 Materials and procedure

The same materials and procedure were used as in the English version of Experiment 2 (Experiment 2A; see Chapter 4). The L2ers took about 20 minutes to complete the task.

⁵⁰ Contemori and Dussias (2016) conjectured that “the L2 speakers adopted the pronoun as a default strategy to avoid the processing cost associated with the task of choosing a referential expression” (p. 1266). This seems similar to what Sorace (2011) claims about near-native L2ers' overuse of overt subject pronouns as a default strategy (see Chapter 5), except that for Contemori and Dussias the pronoun is the *more reduced* RE (in non-null-subject English), but for Sorace it is the *more explicit* RE (in null subject Italian/Spanish). It seems far-fetched to think that an overt pronoun is the “default” simply because it's an overt pronoun.

6.2.3 Preparation for data analysis

The author transcribed the participants' utterances for Picture 2. As in the experiment with native English speakers, only the responses that included a pronominal subject or a repeated-name subject for a target entity were statistically analyzed. Although English, as a non-null-subject language, disallows null subjects (in tensed clauses), one conceivable outcome in the L2ers' subject-RE production was that they would use this form as they do in their null-subject L1. However, the data indicate that there was no response that had a null subject from the L1-Chinese L2ers and only 11 that did from the L1-Japanese L2ers. This suggests that the L2ers did not transfer the use of this form to their L2 English. The percentage of the excluded data, including null-subject responses, was 7.0% in the L2 Chinese group and 4.6% in the L2 Japanese group.

6.2.4 Results

Mixed-effects logistic regression models were used to statistically analyze the categorical data. The Number of Entities–Discourse (the One-Entity condition vs. the conditions with two entities), Number of Entities–Picture 2 (the Two-Entity conditions vs. the Two→One-Entity conditions), Gender (GM vs. GMM), Transition (Continue vs. Shift), and Proficiency (C-test scores) were used as fixed effects and Participant and Item as random effects. The seven conditions were analyzed in three separate analyses as in Experiment 2A. We will also conduct group comparisons using Helmert coding: Native English speakers from Experiment 2A were compared with the two L2 groups combined ("L1 vs. L2," coded with -0.5 and 0.5 , respectively), and then the L1-Chinese L2ers were compared with the L1-Japanese L2ers ("CHIL2 vs. JPNL2," coded with -0.5 and 0.5 , respectively).

Presence of a competitor in the discourse

The first analysis compared the use of repeated names in the One-Entity condition, the Two-Entity GMM Continue condition, and the Two→One-Entity GMM Continue condition to see whether participants produced a repeated-name subject significantly more often when a competitor—encoded as the prepositional object of the description sentence of Picture 1 in the discourses with two entities—is present than when there is only one entity in the discourse. The maximal model in (45) was initially used to do the group analysis, but it failed to converge. This

led us to use separate models, one with the effect of Number of Entities–Discourse crossed with the group predictors and the other with the effect of Number of Entities–Picture 2 crossed with the group predictors.

```
(45) glmer(RE ~ (L1 vs. L2 + CHIL2 vs. JPNL2) * (Number of Entities–Discourse + Number of  
Entities–Picture 2) + (1 + (Number of Entities–Discourse + Number of Entities–Picture 2) |  
Participant) + (1 + (L1 vs. L2 + CHIL2 vs. JPNL2) * (Number of Entities–Discourse +  
Number of Entities–Picture 2)) | Item), data, family = binomial())
```

Figure 6.1 shows the mean proportion of repeated-name subjects in the three participant groups.

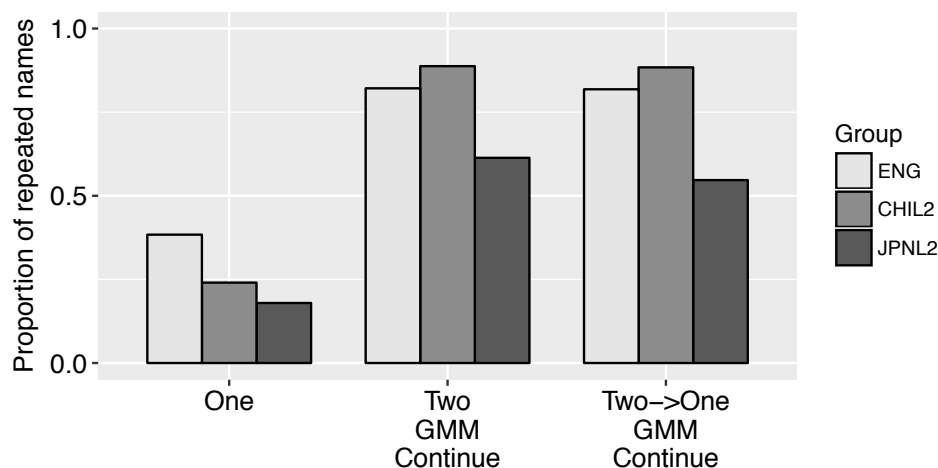


Figure 6.1. Mean proportion of repeated-name subjects in the One-Entity vs. GMM Continue conditions (English natives, L1-Chinese L2ers, & L1-Japanese L2ers)

Table 6.2 summarizes the statistical results. In the statistics tables, “*” indicates a significant effect at the < .05 level and “**” at the < .01 level.

Table 6.2. Statistical results for the group comparison of the One-Entity vs. GMM Continue conditions (English natives, L1-Chinese L2ers, & L1-Japanese L2ers)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Effect of Number of Entities–Discourse				
L1 vs. L2	–.803	.164	–4.895	< .001 **
CHIL2 vs. JPNL2	–1.526	.142	–10.717	< .001 **
Number of Entities–Discourse	3.012	.138	21.864	< .001 **
L1 vs. L2 × Number of Entities–Discourse	.625	.280	2.233	.026 *
CHIL2 vs. JPN L2 × Number of Entities–Discourse	–1.653	.283	–5.848	< .001 **
Effect of Number of Entities–Picture 2				
L1 vs. L2	–.665	.130	–5.102	< .001 **
CHIL2 vs. JPNL2	–1.043	.109	–9.616	< .001 **
Number of Entities–Picture 2	–.112	.116	–.969	.333
L1 vs. L2 × Number of Entities–Picture 2	–.205	.270	–.760	.447
CHIL2 vs. JPN L2 × Number of Entities–Picture 2	–.179	.250	–.716	.474

In the analysis for Number of Entities–Discourse, all main and interaction effects were significant. The proportion of repeated-name subjects was significantly higher in the native English speakers than in the L2ers, and it was significantly higher in the L1-Chinese L2ers than in the L1-Japanese L2ers. Still, both the native speakers and the L2ers produced repeated-name subjects more often in the conditions with two entities than in the One-Entity condition. The interaction effects indicate that the increase in the proportion of repeated-name subjects from the One-Entity condition to the conditions with two entities was different for the L2ers compared to the native English speakers, and that the increase was also different for the L1-Chinese L2ers vs. the L1-Japanese L2ers.

In the analysis for Number of Entities–Picture 2, there were main effects of L1 vs. L2 and CHIL2 vs. JPNL2, as in the analyses above. However, there was neither a main effect of Number of Entities–Picture 2 nor interactions of this predictor with the L1 vs. L2 predictor or with the CHIL2 vs. JPNL2 predictor. The proportion of repeated-name subjects in the three groups was

not different between the Two-Entity and Two→One-Entity conditions, which suggests that it is not the (un)availability of a second entity in Picture 2 but the presence/absence of the entity in the discourse that increased the participants' production of repeated-name subjects.

Next, we will look at the results in each L2er group; in this analysis, the predictor Proficiency will be added. We start with the L1-Chinese L2ers: Figure 6.2 shows the mean proportion of repeated names in their data, and Table 6.3 summarizes their statistical results.

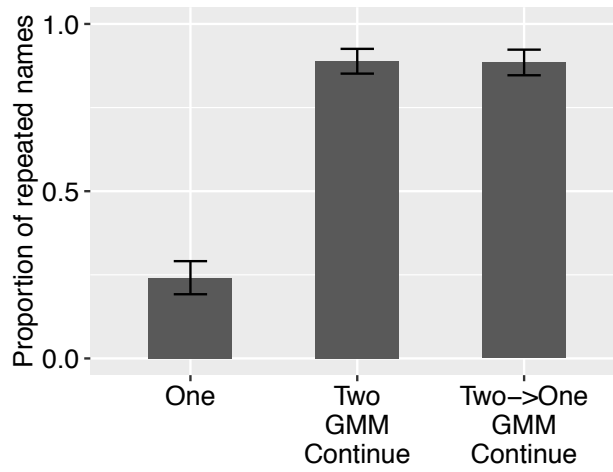


Figure 6.2. Mean proportion of repeated-name subjects in the One-Entity vs. GMM Continue conditions (L1-Chinese L2ers)

Table 6.3. Statistical results for the comparison of the One-Entity vs. GMM Continue conditions (L1-Chinese L2ers)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Number of Entities–Discourse	5.011	.370	13.545	< .001 **
Number of Entities–Picture 2	–.261	.311	–.841	.401
Proficiency	.040	1.496	.027	.979
Number of Entities–Discourse × Proficiency	–.118	1.589	–.074	.941
Number of Entities–Picture 2 × Proficiency	1.108	1.716	.646	.518

The L1-Chinese L2ers produced repeated-name subjects at rates of 24% in the One-Entity condition, 89% in the Two-Entity condition, and 88% in the Two→One-Entity condition. There was neither a main effect of Proficiency nor interactions of Proficiency with

Number of Entities in this group. Figure 6.3 below plots their C-test scores against their rate of repeated-name production in these three conditions. It is clear that the L2ers’ proficiency level did not influence their production of repeated-name subjects.

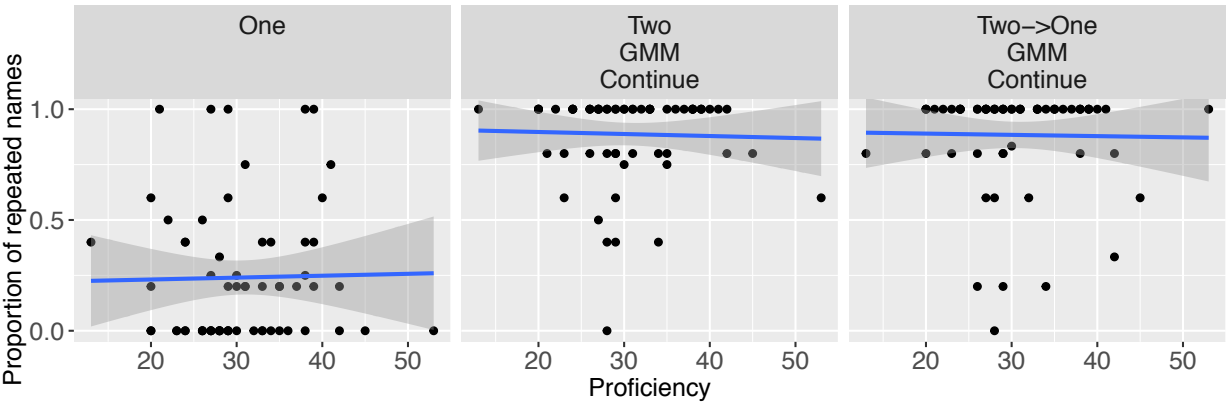


Figure 6.3. Proportion of repeated-name subjects in the One-Entity and GMM Continue conditions plotted along C-test scores (L1-Chinese L2ers)

Figure 6.4 and Table 6.4 provide the L1-Japanese L2ers’ results.

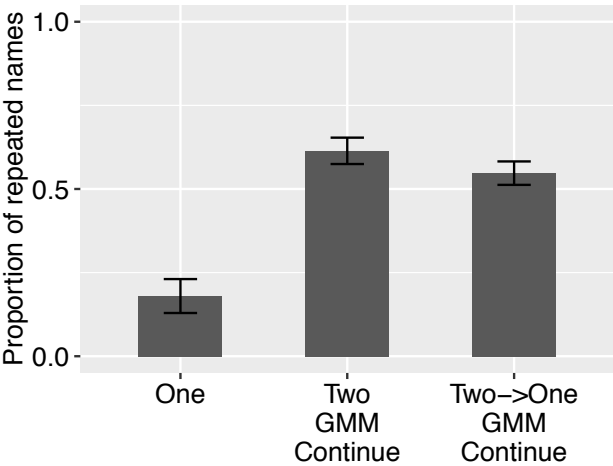


Figure 6.4. Mean proportion of repeated-name subjects in the One-Entity vs. GMM Continue conditions (L1-Japanese L2ers)

Table 6.4. Statistical results for the comparison of the One-Entity vs. GMM Continue conditions (L1-Japanese L2ers)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Number of Entities–Discourse	3.376	.288	11.706	< .001 **
Number of Entities–Picture 2	–.487	.223	–2.179	.029 *
Proficiency	2.483	1.405	1.767	.077
Number of Entities–Discourse × Proficiency	.570	1.068	.533	.594
Number of Entities–Picture 2 × Proficiency	.965	1.027	.940	.347

As with the native English speakers and the L1-Chinese L2ers, the L1-Japanese L2ers produced repeated-name subjects significantly more often in the discourses with two entities than in the One-Entity condition (17.9% in the One-Entity condition, 61.3% in the Two-Entity condition, and 54.7% in the Two→One-Entity condition).

It turned out that the interaction of CHIL2 vs. JPNL2 and Number of Entities–Picture 2 was not significant in the group analysis (Table 6.2), but when only the data from the L1-Japanese L2ers were analyzed and the predictor Proficiency was added to the model, a main effect of Number of Entities–Picture 2 reached significance. The coefficient for the predictor indicates that this group produced fewer repeated-name subjects in the Two→One-Entity condition. On the assumption that competition for attentional resources decreases referent accessibility and, consequently, increases the production of repeated-name subjects (Arnold & Griffin, 2007), these results imply that for the L1-Japanese L2ers, the presence of a second entity in the discourse as well as the visual availability of its image in Picture 2 decreased the accessibility of the main entity, and this led to a rise in the production of repeated-name subjects.

The plots in Figure 6.5 show that as English proficiency among the L1-Japanese L2ers increases, the proportion of repeated-name subjects likewise increases and become closer to the native English speakers' proportions (81.8% in the Two-Entity condition and 82.1% in the Two→One-Entity condition [see Chapter 4, Experiment 2A, Figure 4.1]).

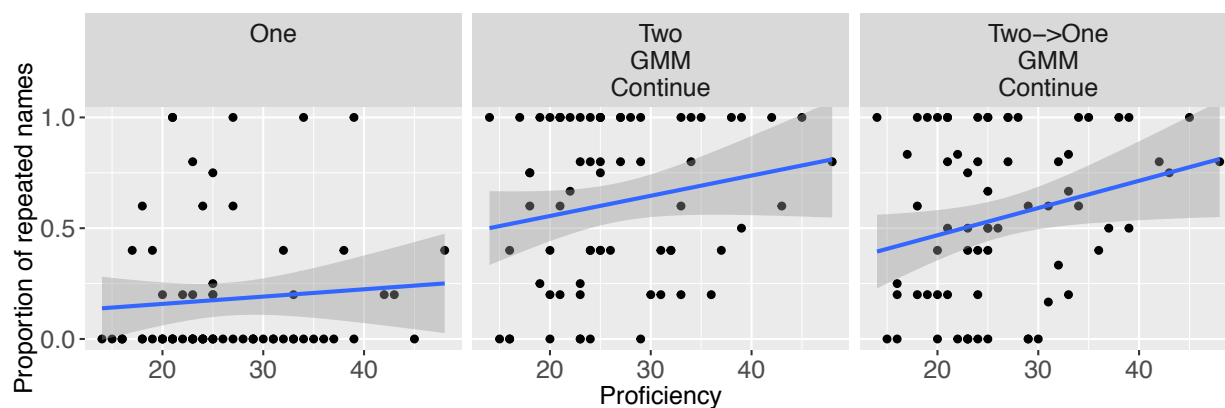


Figure 6.5. Proportion of repeated-name subjects in the One-Entity vs. GMM Continue conditions plotted along C-test scores (L1-Japanese L2ers)

Number of Entities × Gender

The second analysis looks at whether the gender manipulation of entities (GM vs. GMM) influences L2ers' RE production. First, the L1-Chinese and L1-Japanese L2ers were compared with the native English speakers from Experiment 2A. The maximal model with the two group predictors and the two conditional predictors (Number of Entities–Picture 2 and Gender) did not converge, so the effects of the condition predictors were examined separately. Figure 6.6 and Table 6.5 show the results.

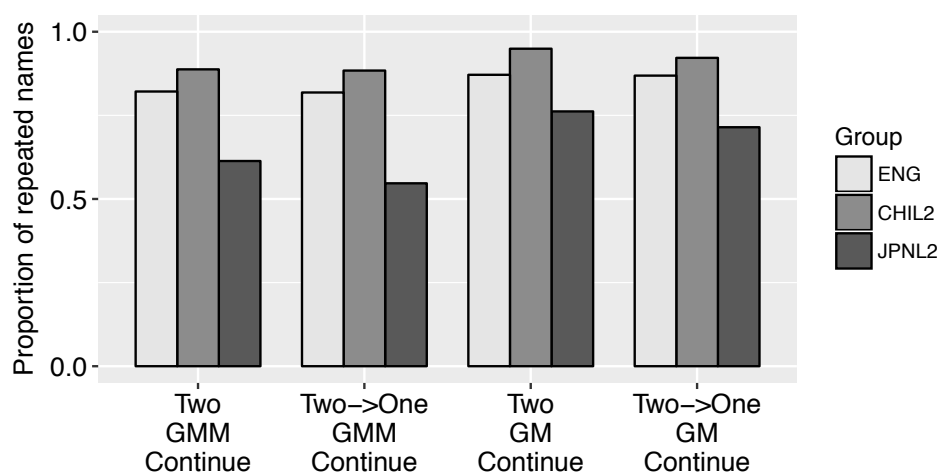


Figure 6.6. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (English natives, L1-Chinese L2ers, & L1-Japanese L2ers)

Table 6.5. Statistical results for the group comparison of the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (English natives, L1-Chinese L2ers, & L1-Japanese L2ers)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Effect of Number of Entities–Picture 2				
L1 vs. L2	–.280	.163	–1.718	.086
CHIL2 vs. JPNL2	–1.998	.140	–14.282	< .001 **
Number of Entities–Picture 2	–.238	.112	2.134	.033 *
L1 vs. L2 × Number of Entities–Picture 2	–.365	.266	–1.374	.170
CHIL2 vs. JPN L2 × Number of Entities–Picture 2	–.057	.258	–.223	.824
Effect of Gender				
L1 vs. L2	–.266	.166	–1.596	.111
CHIL2 vs. JPNL2	–2.060	.145	–14.210	< .001 **
Gender	.820	.117	7.022	< .001 **
L1 vs. L2 × Gender	.404	.272	1.487	.137
CHIL2 vs. JPN L2 × Gender	.285	.267	1.070	.285

For both effects (Number of Entities–Picture 2 and Gender), a main effect of L1 vs. L2 was not significant in this subset of the data, but there was a main effect of CHIL2 vs. JPNL2, indicating that the patterns in the RE production differed between the two L2 groups. As is evident in Figure 6.6, the L1-Japanese L2ers produced many fewer repeated-name subjects than the L1-Chinese L2ers did. In addition, there was a main effect of Number of Entities–Picture 2, which indicates fewer repeated-name subjects were produced in the Two→One-Entity conditions. This seems to be caused mainly by the L1-Japanese L2ers. There was also a main effect of Gender; the three participant groups produced repeated-name subjects significantly more often in the GM conditions than in the GMM conditions.

Figure 6.7 and Table 6.6 show the results for the L1-Chinese L2ers. As in the analysis of the native English speaker data (Experiment 2A), the three-way interaction of Number of Entities–Picture 2, Gender, and Proficiency was removed from the model due to a non-convergence problem. Repeated-name subjects were produced less frequently in the two

GMM Continue conditions than in the two GM Continue conditions, and the difference reached significance (the percentages for the four conditions, from left to right in Figure 6.7: 88.8%, 88.4%, 94.9%, and 92.2%). There was no other significant effect in this group.

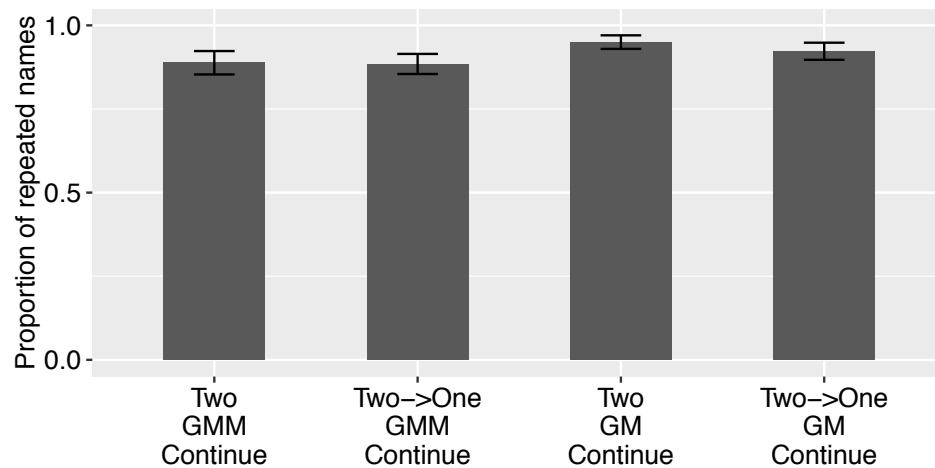


Figure 6.7. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (L1-Chinese L2ers)

Table 6.6. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (L1-Chinese L2ers)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Number of Entities	−.341	.254	−1.343	.179
Gender	.876	.262	3.341	.001 **
Proficiency	.753	1.650	.456	.648
Number of Entities × Gender	−.206	.513	−.401	.688
Number of Entities × Proficiency	.202	1.390	.145	.884
Gender × Proficiency	2.126	1.539	1.381	.167

Figure 6.8 plots the L1-Chinese L2ers' C-test scores against their production rates of repeated-name subjects in these conditions. The plots confirm that English proficiency was not a significant predictor of their subject-RE production patterns.

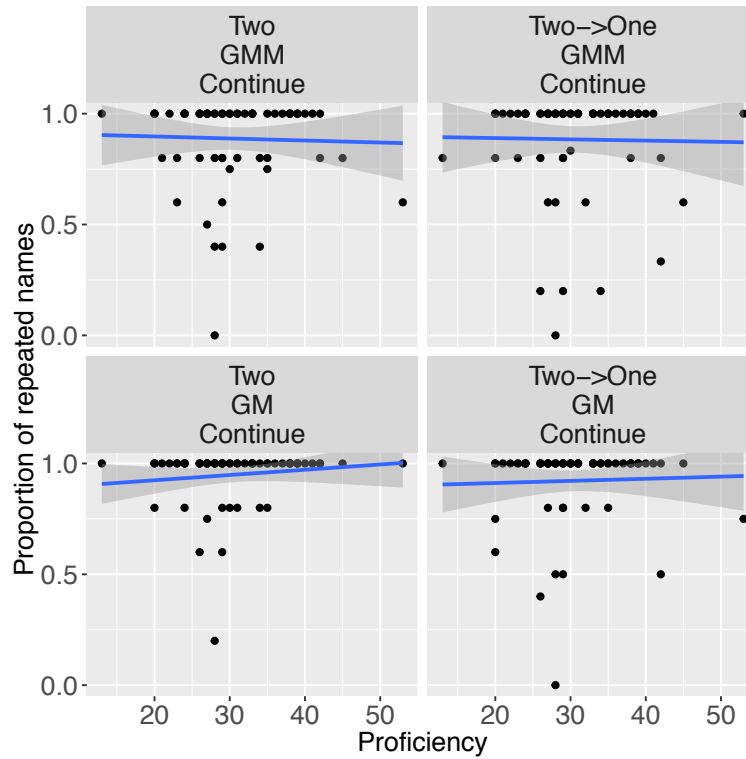


Figure 6.8. Proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions plotted along C-test scores (L1-Chinese L2ers)

Figure 6.9 and Table 6.7 show the results for the mean proportion of repeated-name subjects in the GMM and GM Continue conditions on the part of the L1-Japanese L2ers.

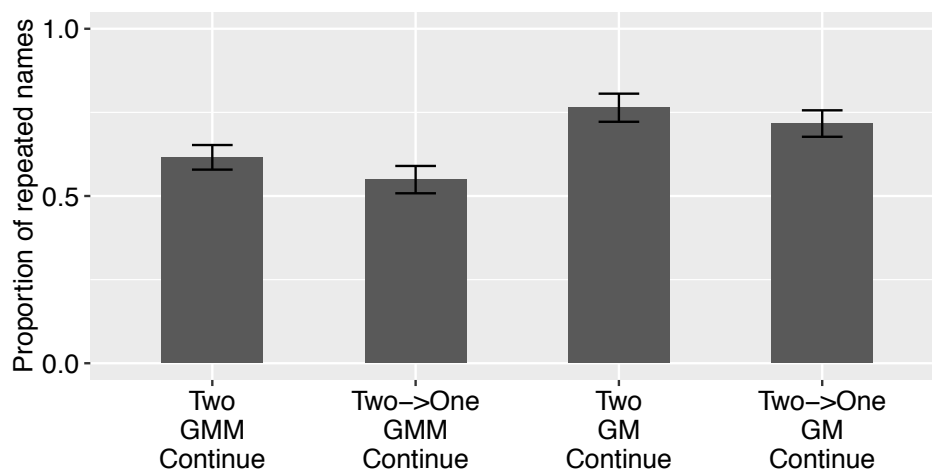


Figure 6.9. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (L1-Japanese L2ers)

Table 6.7. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions (L1-Japanese L2ers)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Number of Entities–Picture 2	–.434	.159	–2.732	.006 *
Gender	1.330	.167	7.961	< .001 **
Proficiency	2.656	1.285	2.066	.039 *
Number of Entities–Picture 2 × Gender	.031	.317	.096	.923
Number of Entities–Picture 2 × Proficiency	.412	.748	.551	.582
Gender × Proficiency–Picture 2	.430	.775	.555	.579

There was a significant main effect for Number of Entities–Picture 2 in this group; L1-Japanese L2ers produced more repeated-name subjects when Picture 2 depicted a second entity (the percentages for the four conditions, from left to right in Figure 6.9: 61.3%, 54.7%, 76.2%, and 71.4%). A main effect of Gender, as expected, was also significant, as was Proficiency. More proficient L1-Japanese L2ers produced more repeated-name subjects in these conditions.

This latter tendency can be seen in the plots in Figure 6.10.

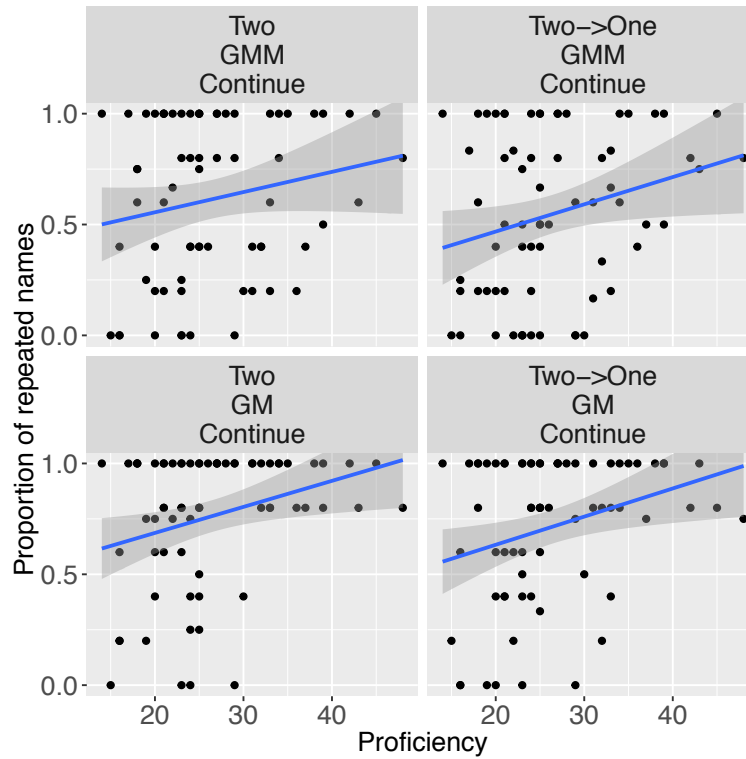


Figure 6.10. Proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM vs. GM Continue conditions plotted along C-test scores (L1-Japanese L2ers)

Number of Entities × Transition

The third analysis looks at whether Transition of the discourse center (Continue vs. Shift) influences L2ers' subject-RE production. The effects of Number of Entities–Picture 2 and Transition were examined separately for the group comparisons due to a failure in model convergence.

Figure 6.11 and Table 6.8 show the results.

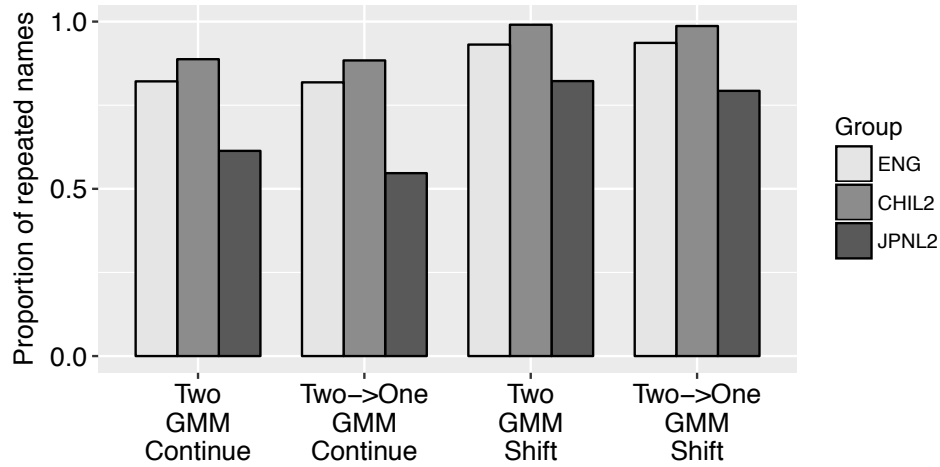


Figure 6.11. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (English natives, L1-Chinese L2ers, & L1-Japanese L2ers)

Table 6.8. Statistical results for the group comparison of the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (English natives, L1-Chinese L2ers, & L1-Japanese L2ers)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Effect of Number of Entities–Picture 2				
L1 vs. L2	–.245	.173	–1.412	.158
CHIL2 vs. JPNL2	–2.166	.151	–14.316	< .001 **
Number of Entities–Picture 2	–.206	.121	1.703	.089
L1 vs. L2 × Number of Entities–Picture 2	–.325	.282	–1.151	.250
CHIL2 vs. JPN L2 × Number of Entities–Picture 2	–.112	.283	–.395	.693
Effect of Transition				
L1 vs. L2	–.055	.204	–.269	.788
CHIL2 vs. JPNL2	–2.693	.221	–12.175	< .001 **
Transition	1.880	.177	10.636	< .001 **
L1 vs. L2 × Transition	.708	.349	2.026	.043 *
CHIL2 vs. JPN L2 × Transition	–1.073	.431	–2.489	.013 *

The subject-RE production patterns did not differ significantly between the native English speakers and the two L2 groups; but overall, the patterns for the L1-Chinese and L1-Japanese L2ers were significantly different. The lack of a main effect of Number of Entities–Picture 2 or its interaction with the group predictors indicates that whether or not Picture 2 depicted a non-target entity (i.e., what remains the second entity from Picture 1 in the Continue condition and what transitions from the competitor in Picture 1 to the main entity in the Shift condition) did not affect the production patterns, but the significant main effect of Transition suggests that the participants produced repeated-name subjects more often in the Shift condition. The interaction of Transition and the group predictors suggests that the increase in the proportion of repeated-name subjects from the Continue condition to the Shift condition was different among the three groups.

Now we look at each L2 group's results. For the L1-Chinese L2ers, the maximal model was first simplified by removing the three-way interaction of Number of Entities–Picture 2, Transition, and Proficiency as well as the slopes for the random effects. However, the model still did not converge. The predictor Proficiency and its interaction with the other two predictors were thus removed one by one from the model, and these simplified models were compared using likelihood ratio tests to see the significance of each effect. It turned out that none of the effects was significant (all $ps > .620$), so Proficiency was removed from the model.

Figure 6.12 and Table 6.9 show the results.

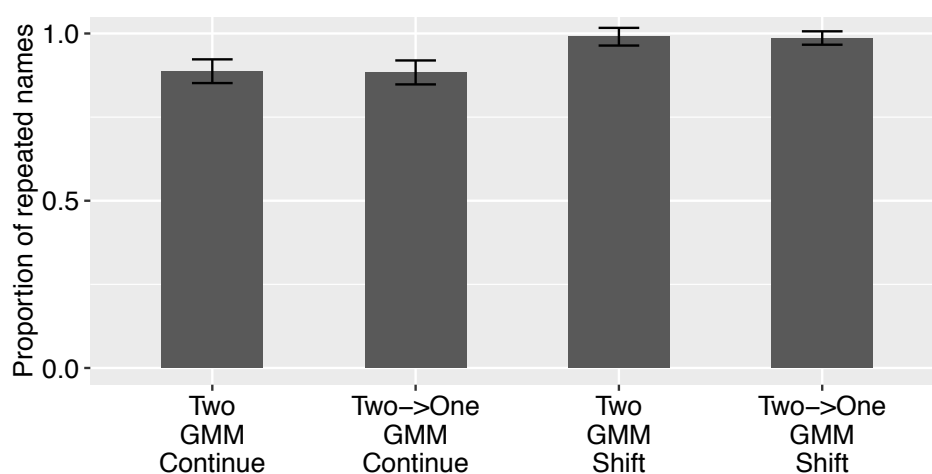


Figure 6.12. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (L1-Chinese L2ers)

Table 6.9. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (L1-Chinese L2ers)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Number of Entities–Picture 2	–.290	.423	–.684	.494
Transition	2.881	.460	6.259	< .001 **
Number of Entities–Picture 2 × Transition	–.123	.859	–.143	.886

The L1-Chinese L2ers produced a repeated-name subject more frequently in the two (GMM) Shift conditions than in the two (GMM) Continue conditions (the percentages for the four conditions, from left to right in Figure 6.12: 88.8%, 88.4%, 99.1%, and 98.7%). These L2ers used repeated names often in the Continue conditions but even more so in the Shift conditions. This suggests that they were sensitive to the decreased accessibility of the second entity in the discourse and chose a more explicit subject-RE form to match the accessibility level. Also, their English proficiency did not affect their subject-RE production in these conditions (Figure 6.13).

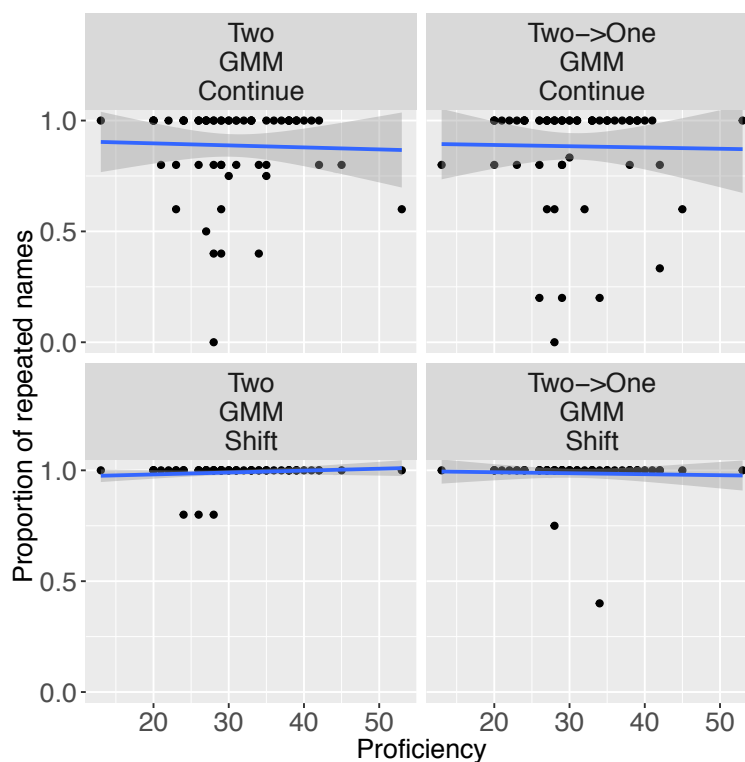


Figure 6.13. Proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions plotted along C-test scores (L1-Chinese L2ers)

The results from the L1-Japanese L2ers are provided in Figure 6.14 and Table 6.10. The regression model was simplified following the procedure used for the L1-Chinese L2ers; but for the L1-Japanese L2ers, Proficiency was included as it was found to be a significant predictor of the results. A main effect of Number of Entities–Picture 2 was significant, indicating that these L2ers produced a repeated-name subject more frequently when Picture 2 depicted the non-target entity (i.e., in the Two-Entity condition) than when it did not. Also, the significant main effect of Transition indicates that the L2ers’ production of repeated-name subjects was higher in the Shift condition than in the Continue condition (the percentages for the four conditions, from left to right in Figure 6.14: 61.3%, 54.7%, 82.2%, and 79.3%).

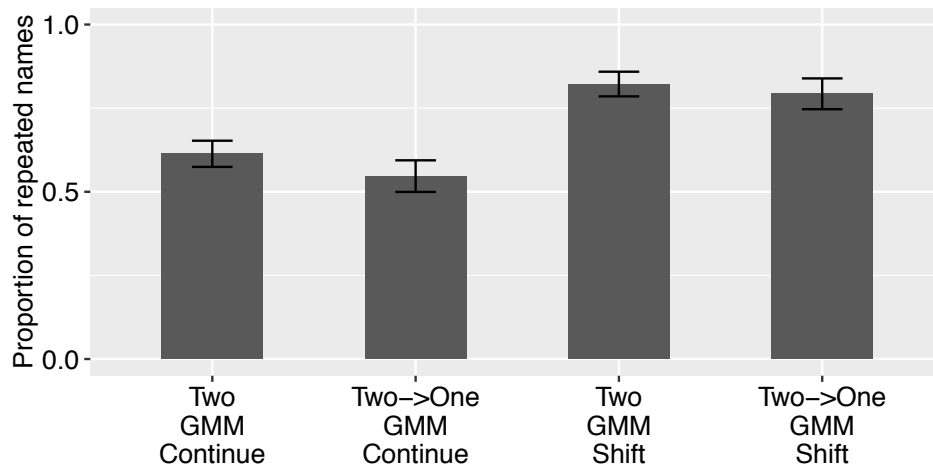


Figure 6.14. Mean proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (L1-Japanese L2ers)

Table 6.10. Statistical results for the comparison of the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions (L1-Japanese L2ers)

	<i>b</i>	SE	<i>z</i>	<i>p</i>
Number of Entities–Picture 2	–.384	.169	–2.269	.023 *
Transition	1.857	.184	10.096	< .001 **
Proficiency	2.778	1.366	2.034	.042 *
Number of Entities–Picture 2 × Transition	.174	.337	.515	.607

The plots in Figure 6.15 show that in all four conditions, more proficient L2ers produced more repeated-name subjects. But a lack of interaction with Number of Entities–Picture 2 or with Transition suggests that the discourse manipulations influenced the L1-Japanese L2ers’ subject-RE production in a similar way at all proficiency levels.

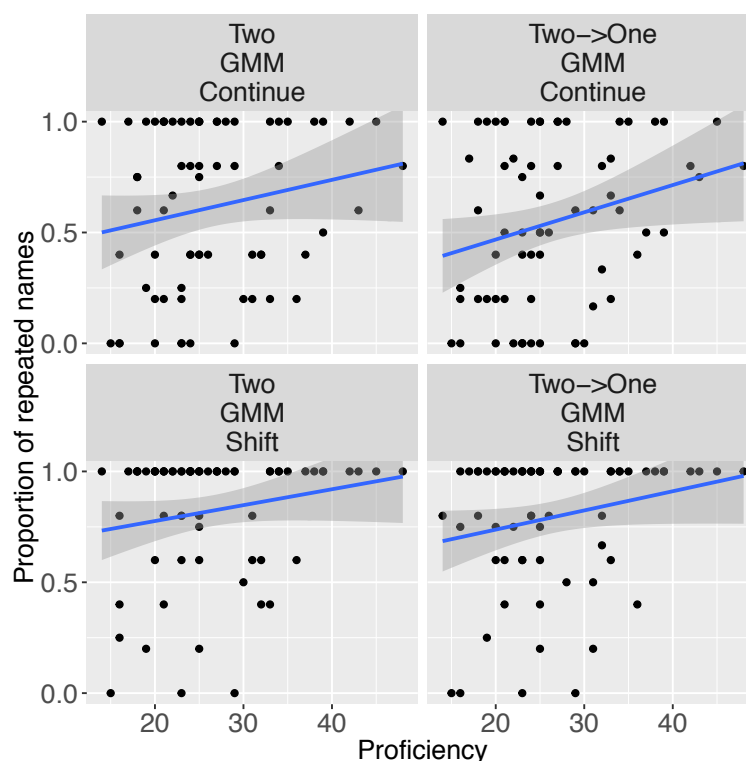


Figure 6.15. Proportion of repeated-name subjects in the Two-Entity and Two→One-Entity GMM Continue vs. Shift conditions plotted along C-test scores (L1-Japanese L2ers)

6.3 Discussion

Experiment 4 investigated how the production of subject-REs (repeated names vs. pronouns) on the part of L1-Chinese and L1-Japanese L2ers of English is influenced by discourse manipulations of: number of entities in the discourse (one vs. two); number of entities depicted in Picture 2 (one vs. two, when there are two entities depicted in Picture 1); gender match/mismatch between the two entities; and accessibility of the target referent (Continue vs. Shift conditions). The L2ers’ production data were compared with the native English speakers’ data from Experiment 2A and were also analyzed within each L2er group.

The findings are as follows. First, the L2ers' RE production patterns were in most cases qualitatively similar to native English speakers'. The L2 data suggest that both groups of L2ers produced repeated-name subjects more frequently in the Two-Entity and Two→One-Entity conditions than in the One-Entity condition. In these discourse contexts, a (gender-marked) pronominal subject would suffice to specify the intended referent, but, like the native English participants in Experiment 2, the L2ers produced a repeated-name subject more often where there was an additional entity in the discourse than when there was only one discourse entity. Thus, the increased use of repeated-name subjects cannot be explained by a strategy of avoiding referential ambiguity. These results are in line with Arnold and Griffin's (2007) claim, originally put forth for native English speakers, that a preference for the more explicit form of subject-REs comes from the decreased accessibility of referents due to competition for attentional resources.

Like native English speakers, both L2 groups also produced repeated-name subjects more frequently in the GM conditions than in the GMM conditions. This suggests that they were sensitive, owing to gender congruency, to the referential ambiguity that the use of a pronominal subject would induce and/or to the decreased accessibility of the target entity (the main entity). In addition, the L2 groups produced repeated-name subjects more frequently in the GMM Shift condition than in the GMM Continue condition. In these conditions, referent accessibility was modulated by syntactic prominence (subject > object) or by order of mention (first-mentioned NP > second-mentioned NP). These results suggest that L2ers are sensitive to an accessibility difference caused by the two types of factors: competition of attentional resources and syntactic prominence//order of mention.

Notably, Experiment 3 tested the same two groups of L2 participants in a self-paced reading task, but in that comprehension task they did not show RT differences between the subject-RE conditions. Some possible explanations for this lack of RT differences were proffered at the end of Chapter 5. Experiment 4 can help in this regard, since it found that the L2ers are sensitive to the referents' accessibility level and can choose subject-REs accordingly. Thus, we can exclude at least one possible reason for the null result in Experiment 3: that the L2ers are unable to match referent accessibility level and subject-RE form. The fact that our L2ers exhibited differences in the proportion of repeated-name subjects furthermore argues against the Interface Hypothesis (IH) (e.g., Sorace, 2011). The IH claims that (near-native) L2ers have difficulty coordinating lexical/morphosyntactic knowledge and discourse/pragmatic information

due to computational difficulty.⁵¹ But our L2 data suggest that even intermediate-to-advanced L2ers, i.e., clearly non-near-native adult L2ers, can indeed coordinate discourse with syntax quite well, like the native English speakers did.

The L2 groups were also similar to each other in terms of the (non)production of null subjects. Since English is a non-null-subject language, responses with a null subject were excluded from analysis. Still, it turned out that none of the responses by the L1-Chinese L2ers had a null subject and only 11 responses by the L1-Japanese L2ers did. This suggests that although native Chinese and Japanese speakers often produced null subjects in the Chinese (Experiment 1B) and Japanese (Experiment 1C) versions of this task (12%–36% for the Chinese natives; 62% for the Japanese natives—see Chapter 3), this subject-RE use was not transferred to subject-RE use in English (at least not in the range of English proficiency manifested by our L2 participants).

There were a few results that differentiated the two L2 groups, however. One was that the L1 vs. L2 predictor interacted with Number of Entities–Picture 2. This was due to the L1-Japanese L2ers producing fewer repeated-name subjects in the Two→One-Entity GMM condition than in the Two-Entity GMM condition; the L1-Chinese L2ers did not show a significant difference between these two conditions. The results for the L1-Japanese L2ers suggest that when the second entity (i.e., an entity encoded in prepositional-object position) was re-depicted in Picture 2 in the Two-Entity GMM condition, the accessibility of the main entity decreased and they produced repeated names more frequently. It may be that after establishing the entities in their discourse representation for Picture 1, the L1-Japanese L2ers were less able than the L1-Chinese L2ers and the native English speakers to maintain the activation of the second entity and so its re-depiction in Picture 2 helped them re-establish it in the representation. If this is the case, then we predict that L1-Japanese L2ers with a relatively smaller memory capacity would have been affected by the re-depiction more than those with a larger memory capacity, i.e., they would have produced fewer repeated-name subjects when the re-depiction was absent in the Two→One-Entity condition.

Another difference was the factor of Proficiency. In all the scatter plots created from the L1-Chinese L2ers' data, the trend lines were almost completely flat, suggesting that the

⁵¹ “[P]erformance at the syntax-pragmatics interface may remain permanently unstable” (Sorace, 2012, p. 213).

production pattern was similar across proficiency levels, whereas the slope of the lines in the L1-Japanese L2ers' data was much steeper (except, perhaps, in the One-Entity condition); in the discourses with two entities, more proficient L1-Japanese L2ers produced more repeated-name subjects. Although the average of the C-test scores was slightly higher in the L1-Chinese L2ers than in the L1-Japanese L2ers, this will not explain the difference, because participants across the two groups who earned similar scores (e.g., 20 to 30 points) show rather different repeated-name subject rates. At this point, no answer can be provided for this group difference.

Moreover, overall, the L1-Chinese L2ers produced repeated-name subjects at higher rates than the L1-Japanese L2ers did (83.8% vs. 63.1%, respectively); put differently, the L1-Japanese participants used more pronominal subjects than the L1-Chinese L2ers did. From the scatter plots, it is clear that the smaller proportion of repeated names by the L1-Japanese L2ers mainly comes from the small proportions among the low-proficient L2ers. Contemori and Dussias (2016) say that the reason their L1-Spanish L2ers of English produced fewer repeated-name subjects overall than the native English speakers did is because L2ers adopt a strategy to use pronouns as the default subject-RE form during costly computations. In our data, however, this proposal does not extend to the high production rates of repeated-name subjects by the L1-Chinese L2ers.

One idea we had in regard to this issue concerns the discourses with two entities. When narrating the event depicted in Picture 2, participants occasionally described what the target entity was doing and then added something about the other entity, either depicted smaller than the target (Two-Entity conditions) or not depicted at all (the Two→One-Entity conditions). We wondered whether the relatively higher proportion of repeated names in the L1-Chinese L2ers might be due to a greater tendency to refer to both entities, using repeated-name subjects for each. However, this turned out not to be the cause of the difference between the L2 groups because the frequency of responses containing reference to both entities was about equal among the participant groups: 3.6% in English natives, 2.6% in the L1-Chinese L2ers, and 3.0% in the L1-Japanese L2ers. Thus, whether participants added the description of a non-target entity in their utterances does not explain the higher rate of repeated names in the L1-Chinese L2ers.

Another idea we had for explaining this difference between the L2 groups was that the higher repeated-name rate in the L1-Chinese L2ers may come from ambiguity avoidance in their L1 Chinese. We saw in Chapter 4 that native Chinese speakers almost always produced

repeated-name subjects in discourses with two entities, regardless of the manipulation of gender match/mismatch. We interpreted the results as the speakers' avoidance of referential ambiguity because the (third-person) masculine and feminine pronouns in Chinese are phonologically identical. It may be that the L1-Chinese L2ers in the current experiment produced repeated-name subjects frequently in English, just as they do in their L1. This would explain the discrepancy in the data between the L1-Chinese and L1-Japanese L2ers because *kare/kanozō* in Japanese do mark gender. This could also help explain the finding in Contemori and Dussias' (2016) that the L1-Spanish L2ers of English produced fewer repeated-name subjects than English natives because Spanish (third-person) subject pronouns *él/ella* also mark gender. More research is needed to confirm/disconfirm this suggestion.

CHAPTER 7

CONCLUSION

Referential expressions (REs) are one of the most important elements in a sentence. We comprehend and produce sentences to understand and convey messages about people and things and events and experiences. In almost every sentence, we refer to entities using pronouns, demonstratives, NPs, etc. REs are used not only to pick out entities but also to create coherence between two sentences as well as within paragraphs and larger units of text. Text analyses (e.g., Givón, 1983) have found that when the speaker uses REs, he/she follows, by and large, an inverse relationship between the explicitness of an RE and the accessibility of its referent. This is often explained by Grice's (1975) Maxim of Quantity ("be as informative as required but do not be more informative than required") or by a more psychological/cognitive approach that says that a large amount of information in an explicit RE is necessary to retrieve an inaccessible representation of a discourse entity but a small amount of information in a reduced RE is enough to retrieve an accessible representation of an entity (Ariel, 1990). When the Maxim of Quantity is violated or when, say, a reduced RE form is used to refer to an inaccessible entity, the hearer experiences processing difficulty and/or perceives a lack of coherence. Thus, the appropriate use of REs is a key factor for smooth and efficient communication.

However, learning the appropriate use of REs in a nonnative language may be challenging. Since different sets of RE types/forms are available in different languages, second language learners (L2ers) may well need to learn a new one from the target language (TL). And even if the same form of REs (e.g., an overt pronoun) is available in the native language (L1) and the TL, they may well have different discourse functions (e.g., to maintain the current discourse focus or to shift the discourse focus). Moreover, as a discourse unfolds, the focus can shift dynamically from one discourse entity to another, and various discourse features determine the preferred RE forms. This makes it extremely difficult to teach how to use REs in discourse, so L2ers need to acquire this in some way through experience. The present study asked whether L2ers—whose L1 and TL have different RE-form inventories—can calculate the relative accessibility of an entity in discourse and associate the degrees of accessibility with particular RE forms of the TL.

7.1 Major findings

Experiment 1 examined the online comprehension of subject-REs in discourse by native speakers of English, Chinese, and Japanese using a sentence-by-sentence self-paced reading task adapted from Gordon et al. (1993). It was assumed that when participants read sentences with a preferred subject-RE form, they would read the sentences faster than those with a dispreferred subject-RE form. We first developed three-sentence passages in English as stimuli. We created discourse conditions by crossing two factors: the form of subject-REs (Pronoun vs. Repeated Name) and the transition of the discourse focus (Continue vs. Shift; Grosz et al., 1983, 1995). For the Chinese and Japanese speakers, we carefully translated the English stimuli into Chinese and Japanese, both null-subject languages, and added another RE condition with a null-pronoun subject. Participants read one sentence at a time on a computer, and the reading times (RTs) from the critical/second sentences were compared across the conditions. We looked at the RT patterns calculated with raw RTs as well as with residualized RTs, the latter in order to factor out effects of sentence length. This is important because a shorter RT in one condition than in another could mean either that participants preferred the subject-RE form or that they simply spent less time reading a sentence with a shorter RE (e.g., *He jumped out of bed...*) than a sentence with a longer RE (e.g., *Mark jumped out of bed...*).

Experiment 2, an oral picture-narration task adapted from Arnold and Griffin (2007), looked at the production of subject-REs by each of the three groups of native speakers. In each trial, they saw a sequence of three pictures on a computer and after reading aloud the description sentence for Picture 1, narrated the events depicted in Pictures 2 and 3. Seven discourse contexts were created by manipulating the number of entities in the discourse (one vs. two in Picture 1); if two, the number of entities depicted in Picture 2 (one vs. two), the match/mismatch of the gender of the two entities; and the grammatical role of the NP (subject vs. object) encoding the target entity in the description sentence accompanying Picture 1. We examined which form of subject-REs they produced to refer to the (spotlighted) image of the target entity in Picture 2. Experiments 3 and 4 tested intermediate-to-advanced L2ers of English whose L1 is Chinese or Japanese with the tasks used in Experiments 1 and 2. The major findings are summarized below.

Experiment 1

The raw-RT data showed that native English speakers processed sentences with a pronominal subject faster than those with a repeated-name subject in the Continue condition, or when the antecedent was the subject NP of the preceding sentence (the Repeated Name Penalty [RNP]; Gordon et al., 1993); by contrast, no RT difference between a pronominal subject and a repeated-name subject was found in the Shift condition, or when the antecedent was an object NP of the preceding sentence. The residual-RT data showed a significant interaction of RE and Transition, indicating clearly different processing patterns between the Continue vs. Shift conditions, although pair-wise comparisons suggested that in the Continue condition, the sentences with a pronominal subject were read only marginally faster than those with a repeated-name subject. On the assumption that the subject is syntactically more prominent than an object and that the entity denoted by a subject NP is more accessible than an entity denoted by an object NP, the overall RT patterns were interpreted as indicating the English natives' preference of a pronominal subject for an accessible discourse entity.

For native Japanese speakers, the results from the raw and residual RTs both suggested that the participants preferred a null-pronoun subject over either an overt-pronoun subject or a repeated-name subject when the antecedent was the subject NP of the preceding sentence; when the antecedent was an object NP of the preceding sentence, there was no clear RE preference. Importantly, an overt-pronoun subject was *never* preferred over null-pronoun or repeated-name subjects. This was taken as the Japanese speakers' dispreference of overt pronominal *kare/kanozō* ('he'/'she').

Native Chinese speakers displayed different RT patterns between the analysis of raw RTs and the analysis of residual RTs. When the antecedent was the subject of the preceding sentence, the raw-RT data showed a significantly shorter RT for an overt-pronoun subject over a repeated-name subject, but the residual-RT data had no difference. Neither type of data analysis showed a significantly shorter RT for a null-pronoun subject than for the other two subject REs; the residual-RT data even indicated that the RTs for a null-pronoun subject were numerically the longest, which does not conform to the proposed universal that the most reduced RE form is preferred for a highly salient/accessible discourse entity. When the antecedent was an object of the preceding sentence, a repeated-name subject elicited a significantly shorter RT than did either a null or overt pronominal subject in the residual-RT analysis but there was no difference in the

raw-RT analysis. Since the residual-RT calculation—figured on the basis of the number of characters in each sentence—changed the RT patterns from the raw RTs so markedly, other methods of residual conversion need to be explored.

Experiment 2

Native English speakers mainly produced a pronominal subject when referring to the sole entity in the discourse (i.e., a highly accessible entity). But they predominantly produced a repeated-name subject when accessibility of the target entity was reduced either by the presence of a second entity, by the congruence of gender between the two entities, or by the shift of the discourse focus from the entity denoted by the subject in the first sentence to the one denoted by an object. Chinese speakers' and Japanese speakers' production of REs was similar in the sense that they produced a repeated-name subject over 90% of the time when two entities were present in the discourse, regardless of any other manipulated factor. However, the two groups differed in discourses with only one entity; the Chinese speakers produced an overt-pronoun subject about half the time, whereas the Japanese speakers *never* used an overt-pronoun subject. This bolstered the interpretation of the Japanese RT results (above), namely, that native Japanese speakers disprefer overt pronouns in general.

Experiment 3

Neither the raw RT data nor the residual RT data showed a significant RT difference between the two subject-RE conditions (pronoun vs. repeated name) in either L2 group. However, the residual RT data indicated a main effect of Transition; both L2 groups comprehended sentences in the Shift condition faster than those in the Continue condition, although Transition did not interact with subject-RE.

Experiment 4

The two L2 groups, like the English natives, produced more repeated-name subjects than pronominal subjects when a second entity was present in the discourse, when the two entities in the discourse matched in gender, and when the target entity was relatively inaccessible. These RE-production patterns sharply contrast with the null results in Experiment 3. Differences between the two L2 groups also emerged. First, one overall difference between them was that the

L1-Chinese L2ers had much higher rates of repeated-name production than the L1-Japanese L2ers. One possible explanation for this is that the L1-Chinese L2ers avoided using overt pronouns just as they do in their L1 Chinese because the masculine and feminine forms of Chinese (third-person) overt pronouns are phonologically identical. Another difference in search of an explanation was that only the L1-Japanese L2ers were likely to produce more repeated-name subjects for a target entity when Picture 2 had an image of the second entity than when it did not. Third, an effect of Proficiency was found only in the L1-Japanese L2ers; more proficient L2ers produced a repeated-name subject more frequently, closer to the rates of repeated-name production in the native English speakers.

7.2 Implications and future directions

The RT patterns in the native English speakers and the RT patterns for the null-pronoun and repeated-name conditions in the native Japanese speakers conform to the universal tendency that the more accessible a discourse entity is, the less explicit form the speaker prefers for the entity. On the discourse accessibility scales by Givón (1983) and Ariel (1990), (unstressed) pronouns in English and null pronouns in Japanese are placed at one end and proper names are placed close to the other end of the scale. Since the pronominal forms and proper names are used to encode rather different levels of discourse accessibility, the likelihood that the present study would be able to find speakers' RE preferences in comprehension was enhanced, and we did find that speakers use them differently depending on discourse contexts. But between the most reduced form and the relatively explicit form, there are several more types of REs such as stressed pronouns and demonstratives. Whether a division of labor can be found between these forms encoding intermediate-level accessibility is a potentially fruitful topic for future experimental studies.

The discrepancy between the results from raw RTs and residual RTs in the native Chinese speakers raises a question of what measure should be used when residualizing raw RTs. In Experiment 1, we counted the number of letters/characters in each sentence and used the value to calculate expected RTs. However, this method greatly shortened the RTs for sentences with overt forms of REs, so sentences with a null-pronoun subject yielded the longest mean RT in the Continue condition. As far as I know, such a result is not predicted by any theory on RE use. As

a follow-up study, we could use, for instance, word frequency or the lengths calculated separately for lexical words and for functional words as additional RT predictors.

We should also look into the syntactic and semantic differences among English pronouns *he/she*, Chinese *tā*, and Japanese *kare/kanozō* to better understand the RE preferences in these languages. Although *tā* and *kare/kanozō* are conventionally translated as *he/she*, studies have shown that their linguistic properties are far from identical (e.g., Aoun & Hornstein, 1991). If the linguistic properties are different, then it is natural to assume that speakers would use the forms differently. In the present study, we found that Japanese speakers never processed *kare/kanozō* faster than a null-pronoun subject or a repeated-name subject, and they virtually never produced an utterance with *kare/kanozō*. We speculated that socio-cultural constraints on the use of *kare/kanozō* were responsible for the avoidance of producing them as subjects, but we should look at the results from a syntactico-semantic perspective as well.

As for the L2ers' results, an obvious question is why, contrary to their data in the production task, their RT data did not show any difference between subject-RE conditions in the comprehension task. In the latter, it may be (i) that they could not fully establish referent representations without adequate contextual support (e.g., they needed more informative passages to construct a firmer discourse representation of the entities; they needed discourses that contain entities with which they are already [very] familiar), and/or (ii) that the sentence-by-sentence self-paced reading task was not suitable to test these L2ers' processing of subject-REs. From the results in Experiment 4 (with the same individuals as participants), we can nevertheless say that these L2ers are indeed sensitive to the difference in accessibility and use a more explicit RE when the accessibility of a target entity decreases. Studies that found similar RE processing patterns between L2ers and native controls (e.g., Cunnings et al., 2016; Ellert, 2003) used the visual-world eye-tracking paradigm and presented context and images of discourse entities, so L2ers' difficulty may not necessarily lie at the integration of multiple sources of information but rather at the establishment of firm discourse representations.

Lastly, our results from the production task are evidence against the fundamental tenet of the Interface Hypothesis (Sorace, 2011), namely, that L2ers' difficulty with the integration of multiple sources of information is the cause of their performance problems at the syntax-discourse interface. Our L2ers produced repeated-name subjects more often when an extra entity was added to the discourse, when the entity was gender-matched with the main

entity, and when the target entity was switched to an entity whose discourse accessibility in the description sentence was reduced by virtue of its syntactic prominence//order of mention (i.e., the Shift condition). If it were true that L2ers necessarily have difficulty taking such discourse information into consideration when making subject-RE choices, then they would not have shown a significant difference in the use of repeated-name subjects across discourse conditions, paralleling, moreover, the pattern of native English speakers.

Overall, the findings of the present study suggest that, *contra* the Interface Hypothesis (Sorace, 2011), even L2ers who are patently nonnative-like (as shown by their Experiment 3 results) can calculate the accessibility of an entity and choose a particular RE form according to level of accessibility, if sufficient contextual/background support is provided.

APPENDIX A: Items for the self-paced reading task (Experiments 1 & 3)

Experimental items: One-entity context

1. a. Tom went to the library to study.
阿强去了图书馆学习。
Āqiáng qùle túshū guǎn xuéxí.
誠君は図書館に勉強しに行きました。
Makoto-kun-wa tosyokan-ni benkyoo-sini ikimasita.
- b. And then he/Tom borrowed a book.
之后, ø/他/阿强借了一本书。
Zhī hòu, ø/tā/Āqiáng jiè le yìběn shū.
そして ø/彼は/誠君は一冊の本を借りました。
Sosite ø/kare-wa/Makoto-kun-wa issatu-no hon-o karimasita.
- c. The title was “Introduction to Psychology.”
题目叫《心理学导论》。
Tímù jiào “xīnlǐ xué dǎolùn.”
そのタイトルは「心理学入門」でした。
Sono-taitoru-wa “sinrigaku nyuumon”desita.
2. a. Jane was studying in a classroom.
徐珍珍在教室里学习。
Xúzhēnzhēn zài jiàoshì lǐ xuéxí.
由香さんは教室で勉強していました。
Yuka-san-wa kyoositu-de benkyoo-siteimasita.
- b. A few times, she/Jane asked other people to please be quiet.
有很多次, ø/她/徐珍珍叫其他人安静。
Yǒu hěnduō cì, ø/tā/Xúzhēnzhēn jiào qítā rén ānjìng.
数回、ø/彼女は/由香さんは他の人に静かにするようお願いしました。
Suukai ø/kanozyo-wa/Yuka-san-wa hoka-no hito-ni sizuka-ni-suru-yoo onegai-simasita.
- c. It is usually easier to study in quiet places.
一般来讲, 安静的地方更适合学习。
Yìbān lái jiǎng, ānjìng de dìfāng gèng shìhé xuéxí.
大抵静かな場所の方が勉強しやすいです。
Taitei sizukana basyo-no hou-ga benkyoo-siyasuidesu.

3. a. Paul was working at a bookstore.
 王大明在书店工作。
 Wángdànmíng zài shūdiàn gōngzuò.
 健太君は本屋で働いていました。
 Kenta-kun-wa honya-de hataraitemasita.
- b. Around noon, he/Paul put a pile of comic books next to the cashier.
 中午时候, ø/他/王大明在收银台的旁边放了一堆漫画书。
 Zhōngwǔ shíhou, ø/tā/Wángdànmíng zài shōuyín tái de pángbiān fàngle yì duī mànhuà shū.
 お昼頃、ø/彼は/健太君はレジの横にマンガを積み上げました。
 Ohiru-koro ø/kare-wa/Kenta-kun-wa rezi-no yoko-ni manga-o tumiagemasita.
- c. The newest books are usually placed in that area.
 最新的书一般都放在那个地方。
 Zuìxīn de shū yìbān dōu fàng zài nàge dìfāng.
 最新の本はたいていその場所に置かれます。
 Saisin-no-hon-wa taitei sono-basyo-ni okaremasu.
4. a. Grace was in an ocean-view restaurant.
 张娟在海景餐厅里。
 Zhāngjuān zài hǎijǐng cāntīng lǐ.
 舞さんは海が見えるレストランにいました。
 Mai-san-wa umi-ga mieru resutoran-ni imasita.
- b. She/Grace had a very delicious steak there.
 在那里, ø/她/张娟吃了非常美味的牛排。
 Zài nàlǐ, ø/tā/Zhāngjuān chīle fēicháng měiwèi de niúpái.
 そこで ø/彼女は/舞さんはとてもおいしいステーキを食べました。
 Sokode ø/kanozyo-wa/Mai-san-wa totemo oisii suteeki-o tabemasita.
- c. It was a fancy dinner.
 那是一顿非常奢华的晚餐。
 Nà shì yí dùn fēicháng shēhuá de wǎncān.
 それは贅沢なディナーでした。
 Sore-wa zeitaku-na dinaa-desita.
5. a. Mark got home in the evening.
 阿伟傍晚回到了家。
 Āwěi bàngwǎn huí dào le jiā.
 隆くんは夕方家に帰ってきました。
 Takashi-kun-wa yuugata ie-ni kaettekimasita.

- b. And then he/Mark turned on the TV.
 之后, ø/他/阿伟打开了电视机。
 Zhīhòu, ø/tā/Āwěi dǎkāile diànshì jī.
 そして ø/彼は隆くんはテレビを付けました。
 Sosite ø/kare-wa/Takashi-kun-wa terebi-o tukemasita.
- c. The news was talking about the election in November.
 新闻是在谈论 11 月份的选举。
 Xīnwén shì zài tánlùn 11 yuèfēn de xuǎnjǔ.
 そのニュースは 11 月の選挙について話していました。
 Sono-nyuusu-wa 11-gatu-no senkyo-ni-tuite hanasiteimasita.
6. a. Ann became interested in pop music.
 周莉莉对流行音乐很感兴趣。
 Zhōulili duì liúxíng yīnyuè hěn gǎn xìngqù.
 理恵さんはポップミュージックに興味を持ちました。
 Rie-san-wa poppumyuzikku-ni kyoomi-o motimasita.
- b. Yesterday she/Ann bought more than 10 CDs.
 昨天, ø/她/周莉莉 买了 10 多张 CD。
 Zuótiān, ø/tā/Zhōulili mǎile 10 duō zhāng CD.
 昨日 ø/彼女は/理恵さんは CD を 10 枚以上買いました。
 Kinoo ø/kanozyo-wa/Rie-wan-wa CD-o 10-mai-izyoo kaimasita.
- c. All the songs had beautiful melodies.
 所有的歌都很好听。
 Suǒyǒu de gē dōu hěn hǎotīng.
 どの歌にもきれいなメロディーが入っていました。
 Dono uta-nimo kirei-na merodii-ga haitteimasita.
7. a. Bob got on the bus.
 李小虎坐上了公交车。
 Lǐxiǎohǔ zuò shàngle gōngjiāo chē.
 直樹くんはバスに乘りました。
 Naoki-kun-wa basu-ni norimasita.
- b. Today he/Bob sat in the back.
 今天, ø/他/李小虎坐在了车厢后面。
 Jīntiān, ø/tā/Lǐxiǎohǔ zuò zàile chēxiāng hòumian.
 今日 ø/彼は/直樹くんは後ろの方に座りました。
 Kyoo ø/kare-wa/Naoki-kun-wa usiro-no hoo-ni suwarimasita.
- c. That was because so many kids were sitting in the front.
 因为有很多小朋友坐在前面。
 Yīnwèi yǒu hěnduō xiǎopéngyǒu zuò zài qiánmiàn.
 たくさんの子供達が前の方に座っていたからです。
 Takusan-no kodomotati-ga mae-no hoo-ni suwatteitakaradesu.

8. a. Kate stopped at the park.
刘敏顺道来到了公园。
Liúmǐn shùndào lái dào le gōngyuán.
綾さんは公園に立ち寄りました。
Aya-san-wa kooen-ni tatiyorimasita.
- b. Then she/Kate sat on a bench.
之后，ø/她/刘敏坐在了椅子上。
Zhīhòu, ø/tā/Liúmǐn zuò zài le yǐzi shàng.
そして ø/彼女は/綾さんはベンチに座りました。
Sosite ø/kanozyo-wa/Aya-san-wa benti-ni suwarimasita.
- c. Many kids were playing in the park.
许多小朋友都在那个公园玩耍。
Xǔduō xiǎopéngyǒu dōu zài nàge gōngyuán wánshuǎ.
たくさんの子供達がその公園で遊んでいました。
Takusan-no kodomotati-ga sono-kooen-de asondeimasita.
9. a. Tom went to the beach to see the sunrise.
阿强去了海边看日出。
Āqiáng qù le hǎibiān kàn rì chū.
誠君は日の出を見にビーチへ行きました。
Makoto-kun-wa hinode-o mini biiti-e ikimasita.
- b. And then he/Tom rented a long surfboard.
之后，ø/他/阿强租了一个长的冲浪板。
Zhīhòu, ø/tā/Āqiáng zū le yíge cháng de chōnglàng bǎn.
そして ø/彼は/誠君は長いサーフボードを借りました。
Sosite ø/kare-wa/Makoto-kun-wa nagai saafuboodo-o karimasita.
- c. There were good waves that day.
那天的浪非常好。
Nàtiān de làng fēicháng hǎo.
その日はいい波が来ていました。
Sonohi-wa iinami-ga kiteimasita.
10. a. Jane was looking for a blue pen.
徐珍珍在找一支蓝色的钢笔。
Xúzhēnzhēn zài zhǎo yì zhī lán sè de gāngbǐ.
由香さんは青のペンを探していました。
Yuka-san-wa ao-no pen-o sagasiteimasita.
- b. Then she/Jane opened a drawer.
于是，ø/她/徐珍珍把抽屉打开。
Yúshì, ø/tā/xúzhēnzhēn bǎ chōuti dǎkāi.
そこでふと ø/彼女は/由香さんは引き出しを開けました。
Sokode futo ø/kanozyo-wa/Yuka-san-wa hikidasi-o akemasita.

- c. But there was only a pencil.
但那里只有一支铅笔。
Dàn nàlǐ zhǐyǒu yì zhī qiānbǐ.
でも鉛筆しか入っていませんでした。
Demo enpitu-sika haitteimasendesita.

Items 11–15 were used only in Experiments 1B (Chinese) and 1C (Japanese)

11. a. Paul had been searching online for a long time.
王大明在网上搜了很长时间。
Wángdà míng zài wǎngshàng sōule hěn cháng shíjiān.
健太君は長い間ネット検索をしていました。
Kenta-kun-wa nagaiaida nettokensaku-o siteimasita.
- b. And then he/Paul finally booked an airplane ticket.
终于，ø/他/王大明买到了一张机票。
Zhōngyú, ø/tā/Wángdà míng mǎi dào le yì zhāng jīpiào.
そして ø/彼は/健太君はやっと航空券を予約しました。
Sosite ø/kare-wa/Kenta-kun-wa yatto kookuukēn-o yoyaku-simasita.
- c. The flight was to New York.
那个航班是前往纽约的。
Nàge hángbān shì qiánwǎng niǔyuē de.
その飛行機はニューヨーク行きでした。
Sono-hikooki-wa nyuuyookuiki-desita.
12. a. Grace was in the kitchen.
张娟正在厨房里。
Zhāngjuān zhèngzài chūfáng lǐ.
舞さんはキッチンにいました。
Mai-san-wa kittin-ni imasita.
- b. She/Grace was baking a huge cheesecake.
ø/她/张娟正在做一个很大的芝士蛋糕。
ø/tā/Zhāngjuān zhèngzài zuò yíge hěn dà de zhīshì dàngāo.
ø/彼女は/舞さんはとても大きなチーズケーキを焼いていました。
ø/kanozyo-wa/Mai-san-wa totemo ookina tiizukeeki-o yaiteimasita.
- c. The whole house was filled with the smell.
整个家里都弥漫着那股味道。
Zhěnggè jiālǐ dōu mímàn zhe nà gǔ wèidào.
家中がその匂いに包まれました。
Iezyuu-ga sono-nioi-ni tutumaremasita.

13. a. Mark took a walk to the park.
阿伟去公园散了步。
Āwěi qù gōngyuán sǎnle bù.
隆君は公園まで散歩に行きました。
Takashi-kun-wa kooen-made sanpo-ni ikimasita.
- b. And then he/Mark played soccer with the little kids.
之后, ø/他/阿伟和小朋友们踢了足球。
Zhīhòu, ø/tā/Āwěi hé xiǎopéngyǒumen tīle zúqiú.
そして ø/彼は隆君は小さな子供達とサッカーをしました。
Sosite ø/kare-wa/Takashi-kun-wa tiisana kodomotati-to sakkaa-o simasita.
- c. Everyone had a good time.
每个人都玩的很开心。
Měi gèrén dōu wán de hěn kāixīn.
みんなが楽しい時間を過ごしました。
Minna-ga tanosii zikan-o sugosimasita.
14. a. Ann turned on the TV.
周莉莉打开了电视。
Zhōulìlì dǎkāile diànshì.
理恵さんはテレビをつけました。
Rie-san-wa terebi-o tukemasita.
- b. And then she/Ann watched the weather forecast for tomorrow.
然后, ø/她/周莉莉关注了明天的天气预报。
Ránhòu, ø/tā/Zhōulìlì guānzhùle míngtiān de tiānqì yùbào.
そして ø/彼女は理恵さんは明日の天気予報を見ました。
Sosite ø/kanozyo-wa/Rie-san-wa asita-no tenkiyohoo-o mimasita.
- c. It will be sunny all day.
一天都将会是晴天。
Yītiān dōu jiāng huì shì qíngtiān.
一日中晴れになりそうです。
Itinitizyuu hare-ni narisoodesu.
15. a. Bob went on a trip.
李小虎去旅游了。
Lǐxiǎohǔ qù lǚyóule.
直樹君は旅行に行きました。
Naoki-kun-wa ryokoo-ni ikimasita.
- b. He/Bob stayed on a Hawaiian island for 3 days.
ø/他/李小虎在夏威夷岛上呆了3天。
ø/Tā/Lǐxiǎohǔ zài xiàwēiyí dǎo shàng dāile 3 tiān.
ø/彼は直樹君は3日間ハワイの島に滞在しました。
ø/Kare-wa/Naoki-kun-wa mikkakan hawai-no sima-ni taizai-simasita.

- c. There were many sea turtles on the beach.

沙滩上有很多海龟。

Shātān shàng yǒu hěnduō hǎiguī.

たくさんのウミガメがビーチにいました。

Takusan-no umigame-ga biiti-ni imasita.

Experimental items: Two-entity context

16. a. Tom apologized to Jane.

阿强向徐珍珍道歉。

Āqiáng xiàng Xúzhēnzhēn dàoqiàn.

誠君は由香さんに謝りました。

Makoto-kun-wa Yuka-san-ni ayamarimasita.

- [continue] b. He/Tom totally forgot about the baseball game on Sunday.

ø/他/阿强完全忘记了周日的棒球赛。

ø/Tā/Āqiáng wánquán wàngjile zhōu rì de bàngqiú sài.

ø/彼は/誠君は日曜日の野球の試合をすっかり忘れていました。

ø/Kare-wa/Makoto-kun-wa nitiyoobi-no yakyuu-no siai-o sukkari wasureteimasita.

- [shift] b'. She/Jane said “OK” but was still angry.

ø/她/徐珍珍虽然嘴里说：“没关系”，但心里还是很生气。

ø/Tā/Xúzhēnzhēn suīrán zuǐlǐ shuō “méiguānxi”, dàn xīnlǐ hái shì hěn shēngqì.

ø/彼女は/由香さんは「いいよ」と言っただけ、まだ怒っていました。

ø/Kanozyo-wa/Yuka-san-wa “iiyo”-to ittakeredo, mada okotteimasita.

- c. They didn't talk for a week.

他们一周都没有说过话。

Tāmen yìzhōu dōu méiyǒu shuō guòhuà.

彼らは一週間口を聞きませんでした。

Karera-wa issyuukan kuti-o kikimasendesita.

17. a. Paul threw a life jacket to Grace.

王大明扔给张娟一件救生衣。

Wángdà míng rēng gěi Zhāngjuān yī jiàn jiùshēngyī.

健太君は舞さんにライフジャケットを投げました。

Kenta-kun-wa Mai-san-ni raifuzyaketto-o nagemasita.

- [continue] b. He/Paul was a lifeguard for injured surfers.

ø/他/王大明是一名救助受伤冲浪者的救生员。

ø/Tā/Wángdà míng shì yī míng jiùzhù shòushāng chōnglàng zhě de jiùshēng yuán.

ø/彼は/健太君は怪我をしたサーファーのためのライフセーバーでした。

ø/Kare-wa/Kenta-kun-wa kega-o sita saafaa-no tame-no raifuseebaa-desita.

- [shift] b'. But she/Grace was injured and couldn't move.
但是 ø/她/张娟受伤了不能动弹。
Dànshì ø/tā/Zhāngjuān shòu shāng le bùnéng dòngtan.
でも ø/彼女は/舞さんは怪我をして動けませんでした。
Demo ø/kanozyo-wa/Mai-san-wa kega-o site ugokemasendesita.
- c. Marine sports are fun but can be dangerous.
水上运动虽然有趣但也存在危险。
Shuǐshàng yùndòng suīrán yǒuqù dàn yě cúnzài wēixiǎn.
マリンスポーツは楽しいけど危険でもあります。
Marinsupootu-wa tanosii-kedo kiken-demo-arimasu.
18. a. Mark gave a pair of shoes to Ann.
阿伟送了一双鞋给周莉莉。
Āwěi sòngle yīshuāng xié gěi Zhōulìlì.
隆君は理恵さんに靴を一足あげました。
Takashi-kun-wa Rie-san-ni kutu-o issoku agemasita.
- [continue] b. He/Mark spent a lot of money for the present.
ø/他/阿伟花了很多钱在这个礼物上。
ø/Tā/Āwěi huāle hěnduō qián zài zhège lǐwù shàng.
ø/彼は/隆君はそのプレゼントにたくさんお金をつぎ込みました。
ø/Kare-wa/Takashi-kun-wa sono-purezento-ni takusan okane-o tugikomimasita.
- [shift] b'. She/Ann was surprised at the expensive present.
ø/她/周莉莉对这么贵的礼物感到特别惊讶。
ø/Tā/Zhōulìlì duì zhème guì de lǐwù gǎndào tèbié jīngyà.
ø/彼女は/理恵さんはその高価なプレゼントに驚きました。
ø/Kanozyo-wa/Rie-san-wa sono-kooka-na purezento-ni odorokimasita.
- c. Nice shoes usually cost over 200 dollars.
一双好鞋，一般价格都在 1000 元以上。
Yīshuāng hǎo xié, yìbān jiàgé dōu zài 1000 yuán yǐshàng.
良い靴はたいてい 200 ドル以上します。
Yoi kutu-wa taitei 200-doru-izyoo-simasu.
19. a. Bob handed 10 dollars to Kate.
李小虎递给了刘敏 10 美元。
Lǐxiǎohǔ dì gěile Liúmǐn 10 měiyuán.
直樹君は綾さんに 10 ドル手渡しました。
Naoki-kun-wa Aya-san-ni 10-doru tewatasimasita.

[continue] b. He/Bob wanted to pay for the snacks.
 ø/他/李小虎想付那份点心的钱。
 ø/Tā/Líxiǎohǔ xiǎng fù nà fèn diǎnxin de qián.
 ø/彼は直樹君はお菓子の分を支払いたかったのです。
 ø/Kare-wa/Naoki-kun-wa okasi-no bun-o siharaitakattanodesu.

[shift] b'. Then she/Kate bought some bottles of beer.
 然后，ø/她/刘敏去买了几瓶啤酒。
 Ránhòu, ø/tā/Liúmǐn qù mǎile jǐ píng píjiǔ.
 そして、ø/彼女は/綾さんはビールを何本か買いました。
 Sosite, ø/kanozyo-wa/Aya-san-wa biiru-o nanbon-ka kaimasita.

c. They are now watching a football game on TV.
 现在他们正在看电视上的橄榄球赛。
 Xiànzài tāmen zhèngzài kàn diànshì shàng de gǎnlǎnqiú sài.
 今彼らはテレビでフットボールの試合をしています。
 Ima karera-wa terebi-de futtobooru-no siai-o miteimasu.

20. a. Jane called Tom.
 周莉莉打电话给阿伟。
 Zhōulìlì dǎ diànhuà gěi Āwěi.
 理恵さんは隆君に電話しました。
 Rie-san-wa Takashi-kun-ni denwa-simasita.

[continue] b. She/Jane was so lonely and wanted to talk with somebody.
 ø/她/周莉莉十分寂寞，想和谁聊聊天。
 ø/Tā/Zhōulìlì shífēn jìmò, xiǎng hé shéi liáo liáotiān.
 ø/彼女は/理恵さんはとても寂しくて、誰かと話したかったのです。
 ø/Kanozyo-wa/Rie-san-wa totemo sabisikute, dareka-to hanasitakattanodesu.

[shift] b'. He/Tom picked up the phone right away and said, "Hello?"
 ø/他/阿伟迅速接起电话说：“喂？”。
 ø/Tā/Āwěi xùnsù jiē qǐ diànhuà shuō “Wéi?”
 ø/彼は/隆君はすぐに電話を取って、「もしもし」と言いました。
 ø/Kare-wa/Takashi-kun-wa suguni denwa-o totte “Mosimosi”-to iimasita.

c. They chatted for an hour.
 他们聊了一个小时。
 Tāmen liáole yíge xiǎoshí.
 彼女達は1時間話しました。
 Kanozyotati-wa 1-zikan hanasimasita.

21. a. Grace taught Paul how to play the piano.
 张娟教王大明怎么弹钢琴。
 Zhāngjuān jiāo Wángdà míng zěnmē tán gāngqín.
 舞さんは健太君にピアノの弾き方を教えました。
 Mai-san-wa Kenta-kun-ni piano-no hikikata-o osiemasita.
- [continue] b. She/Grace chose an easy melody for this first lesson.
 第一节課, ø/她/张娟选了一首简单的曲子。
 Dìyī jiē kè, ø/tā/Zhāngjuān xuǎnle yì shǒu jiǎndān de qǔzi.
 ø/彼女は/舞さんはこの最初のレッスンのために、簡単なメロディーを1つ選びました。
 ø/Kanozyo-wa/Mai-san-wa kono saisyo-no ressun-no tame-ni kantan-na merodii-o hitotu erabimasita.
- [shift] b'. He/Paul became able to play an easy melody in an hour.
 ø/他/王大明一个小时之后就能弹首简单的曲子了。
 ø/Tā/Wángdà míng yí gè xiǎoshí zhīhòu jiù néng tán shǒu jiǎndān de qǔzile.
 ø/彼は/健太君は1時間で簡単なメロディーを1つ弾けるようになりました。
 ø/Kare-wa/Kenta-kun-wa 1-zikan-de kantan-na merodii-o hitotu hikeruyooni narimasita.
- c. They both love music.
 他们都很喜欢音乐。
 Tāmen dōu hěn xǐhuan yīnyuè.
 二人とも音楽が大好きです。
 Futari-tomo ongaku-ga daisukidesu.
22. a. Ann asked Mark for help.
 徐珍珍请阿强帮忙。
 Xúzhēnzhēn qǐng Āqiáng bāngmáng.
 由香さんは誠君にお手伝いを頼みました。
 Yuka-san-wa Makoto-kun-ni otetudai-o tanomimasita.
- [continue] b. She/Ann had to wash many dishes after the party.
 聚会之后, ø/她/徐珍珍需要洗很多盘子。
 Jùhuì zhīhòu, ø/tā/Xúzhēnzhēn xūyào xǐ hěnduō pánzi.
 ø/彼女は/由香さんはパーティの後たくさんのお皿を洗わなければいけませんでした。
 ø/Kanozyo-wa/Yuka-san-wa paathii-no ato takusan-no osara-o arawanakereba ikemasendesita.
- [shift] b'. Then he/Mark turned off the TV and kindly agreed.
 然后, ø/他/阿强马上关了电视, 欣然同意。
 Ránhòu, ø/tā/Āqiáng mǎshàng guānle diànshì, xīnrán tóngyì.
 すると ø/彼は/誠君はテレビを消して、快く引き受けました。
 Suruto ø/kare-wa/Makoto-kun-wa terebi-o kesite, kokoroyoku hikiukemasita.

- c. It's better to work together to save time.
 如果一起洗的话，比较节约时间。
 Rúguǒ yìqǐ xǐ dehuà, bǐjiào jiéyuē shíjiān.
 時間を節約するために一緒にやる方がいいです。
 Zikan-o setuyaku-suru-tameni issyoni yaruhoo-ga iidesu.

23. a. Kate yelled at Bob in the classroom.
 刘敏在教室里对着李小虎大吼大叫。
 Liúmǐn zài jiàoshì lǐ duìzhe Lǐxiǎohǔ dà hǒu dà jiào.
 綾さんは教室で直樹君に怒鳴りました。
 Aya-san-wa kyoositu-de Naoki-kun-ni donarimasita.

- [continue] b. She/Kate was so mad and loud.
 ø/她/刘敏好像非常生气，声音特别大。
 ø/Tā/Liúmǐn hǎoxiàng fēicháng shēngqì, shēngyīn tèbié dà.
 ø/彼女は/綾さんはかんかんに怒っていて、とてもうるさかったです。
 ø/Kanozyo-wa/Aya-san-wa kankan-ni okotteite, totemo urusakattadesu.

- [shift] b'. But he/Bob laughed as hard as usual.
 但是，ø/他/李小虎还是像平时那样嬉皮笑脸。
 Dànshì, ø/tā/Lǐxiǎohǔ háishi xiàng píngshí nà yàng xīpíxiàoliǎn.
 でも ø/彼は直樹君はいつものように大声で笑いました。
 Demo ø/kare-wa/Naoki-kun-wa itumono-yooni oogoe-de waraimasita.

- c. The other students stared at them quietly.
 其他学生都不说话，看着他们。
 Qítā xuésheng dōu bù shuōhuà, kànzhe tāmen.
 他の学生は黙って彼女達を見ていました。
 Hoka-no gakusee-wa damatte kanozyotati-o miteimasita.

24. a. Tom teased Jane.
 阿强开了徐珍珍一个玩笑。
 Āqiáng kāile Xúzhēnzhēn yí gè wánxiào.
 誠君は由香さんをからかいました。
 Makoto-kun-wa Yuka-san-o karakaimasita.

- [continue] b. He/Tom said some pretty embarrassing things.
 ø/他/阿强说了一件非常尴尬的事。
 ø/Tā/Āqiáng shuōle yí jiàn fēicháng gāngà de shì.
 ø/彼は/誠君はとても恥ずかしくなるようなことを言いました。
 ø/Kare-wa/Makoto-kun-wa totemo hazukasiku-naruyoona koto-o iimasita.

- [shift] b'. She/Jane was embarrassed in front of the others.
 ø/她/徐珍珍在其他人人面前感到非常尴尬。
 ø/Tā/Xúzhēnzhēn zài qítā rén miàncián gǎndào fēicháng gāngà.
 ø/彼女は/由香さんは他の人の前で恥ずかしい思いをしました。
 ø/Kanozyo-wa/Yuka-san-wa hoka-no hito-no mae-de hazukasii omoi-o simasita.
- c. They always make fun of each other.
 他们总是互相开玩笑。
 Tāmen zǒng shì hùxiāng kāiwánxiào.
 彼らはいつもお互いを笑い者になっています。
 Karera-wa itumo otagai-o waraimono-ni siteimasu.
25. a. Paul rescued Grace in a big river.
 阿伟从大河里救起了周莉莉。
 Āwěi cóng dàhé lǐ jiù qǐle Zhōulili.
 隆君は理恵さんを大きな川で救出しました。
 Takashi-kun-wa Rie-san-o ookina-kawa-de kyuusyutu-simasita.
- [continue] b. He/Paul happened to have a lifeguard license.
 ø/他/阿伟恰好有救生员的资格证。
 ø/Tā/Āwěi qiàhǎo yǒu jiùshēng yuán de zīgé zhèng.
 ø/彼は/隆君はたまたまライフセーバーの免許を持っていました。
 ø/Kare-wa/Takashi-kun-wa tamatama raifuseebaa-no menkyo-o motteimasita.
- [shift] b'. She/Grace cried and said, "Thank you!"
 ø/她/周莉莉哭着说, "谢谢!"。
 ø/Tā/Zhōulili kūzhe shuō, "Xièxie!"
 ø/彼女は/理恵さんは泣いて「ありがとう!」と言いました。
 ø/Kanozyo-wa/Rie-san-wa naite "Arigatoo!"-to iimasita.
- c. They were able to avoid a serious accident.
 他们避免了悲剧的发生。
 Tāmen bìmiǎnle bēijù de fā shēng.
 彼らは大事故をまぬがれました。
 Karera-wa daiziko-o manugaremasita.
26. a. Jane pushed Tom in a crowded train.
 徐珍珍在拥挤的电车里面推了一下阿强。
 Xúzhēnzhēn zài yōngǐ de diànchē lǐmiàn tuīle yíxià Āqiáng.
 由香さんは満員電車の中で誠君を押しました。
 Yuka-san-wa manindensya-no naka-de Makoto-kun-o osimasita.

[continue] b. She/Jane didn't do it intentionally.
 ø/她/徐珍珍不是故意这样做的。
 ø/Tā/Xúzhēnzhēn bùshì gùyì zhèyàng zuò de.
 ø/彼女は/由香さんは意図的にやったわけではありません。
 ø/Kanozyo-wa/Yuka-san-wa itoteki-ni yattawake-dewa arimasen.

[shift] b'. He/Tom got upset and looked back.
 ø/他/阿强很生气，并回头看。
 ø/Tā/Āqiáng hěn shēngqì, bìng huítóu kàn.
 ø/彼は/誠君は怒って後ろを振り返りました。
 ø/Kare-wa/Makoto-kun-wa okotte usiro-o furikaerimasita.

c. Rush hours on trains are annoying.
 地铁的高峰时段总是让人很烦。
 Ditiě de gāofēng shíduàn zǒng shì ràng rén hěn fán.
 電車のラッシュアワーはイライラします。
 Densya-no rassyuawaa-wa iraira-simasu.

27. a. Grace emailed Paul.
 张娟发了封电子邮件给王大明。
 Zhāngjuān fāle fēng diànzǐ yóujiàn gěi Wángdà míng.
 舞さんが健太君にメールをしました。
 Mai-san-ga Kenta-kun-ni meeru-o simasita.

[continue] b. She/Grace wanted to share pictures from the party.
 ø/她/张娟想分享一下聚会时候的照片。
 ø/Tā/Zhāngjuān xiǎng fēnxiǎng yíxià jùhuì shíhou de zhàopiàn.
 ø/彼女は/舞さんはパーティでの写真をシェアしたかったです。
 ø/Kanozyo-wa/Mai-san-wa paathii-deno syasin-o syea-sitakattanodesu.

[shift] b'. Then he/Paul immediately responded to the message.
 然后，ø/他/王大明迅速回复了那封邮件。
 Ránhòu, ø/tā/Wángdà míng xùnsù huífùle nà fēng yóujiàn.
 すると、ø/彼は/健太君はそのメッセージにすぐ返信しました。
 Suruto, ø/kare-wa/Kenta-kun-wa sono-messeezi-ni sugu hensin-simasita.

c. Email is a very useful communication tool.
 电子邮件是一个非常方便的工具。
 Diànzǐ yóujiàn shì yí gè fēicháng fāngbiàn de gōngjù.
 Eメールはとても便利なツールです。
 Email-wa totemo benri-na tuuru-desu.

28. a. Jane work up Tom at 9 am this morning.
徐珍珍今天早上 9 点叫阿强起床。
Xúzhēnzhēn jīntiān zǎoshang 9 diǎn jiào Āqiáng qǐchuáng.
由香さんは今朝 9 時に誠君を起こしました。
Yuka-san-wa kesa 9-zi-ni Makoto-kun-o okosimasita.
- [continue] b. She/Jane took off the blanket and said, “Wake up!”
ø/她/徐珍珍掀开毛毯，吼道：“起来了”。
ø/tā/ Xúzhēnzhēn xuiān kāi máotǎn, hǒu dào “Qǐlaile.”
ø/彼女は/由香さんは毛布をめくって「起きて！」と言いました。
ø/kanozyo-wa/Yuka-san-wa moofu-o mekutte “Okite!”-to iimasita.
- [shift] b'. He/Tom looked at the alarm and jumped out of bed.
ø/他/阿强看了看闹钟，从床上跳了下来。
ø/Tā/Āqiáng kànle kàn nàozhōng, cóng chuángshàng tiàole xiàlai.
ø/彼は/誠君は目覚まし時計を見て、ベッドから飛び出しました。
ø/Kare-wa/Makoto-kun-wa mezamasidokei-o mite, beddo-kara tobidasimasita.
- c. Classes start at 9:30 am.
课是 9 点半开始。
Kè shì 9 diǎn bàn kāishǐ.
授業は 9 時半に始まります。
Zyugyoo-wa 9-zihan-ni hazimarimasu.
29. a. Grace wrote a letter to Paul.
张娟写了封信给王大明。
Zhāngjuān xiěle fēngxìn gěi Wángdà míng.
舞さんは健太君に手紙を書きました。
Mai-san-wa Kenta-kun-ni tegami-o kakimasita.
- [continue] b. She/Grace mentioned a funny event that happened this week.
ø/她/张娟提到了这周一件有趣的事。
ø/Tā/Zhāngjuān tí dào le zhè zhōuyī jiàn yǒuqù de shì.
ø/彼女は/舞さんは今週起こった面白い出来事に触れました。
ø/Kanozyo-wa/Mai-san-wa konsyuu okotta omosiroi dekgoto-ni furemasita.
- [shift] b'. He/Paul received it this afternoon.
ø/他/王大明是今天下午收到的。
ø/Tā/Wángdà míng shì jīntiān xiàwǔ shōu dào de.
今日の午後、ø/彼は/健太君はそれを受け取りました。
Kyoo-no gogo, ø/kare-wa/Kenta-kun-wa sore-o uketorimasita.

- c. They exchange a letter every month.
 两人每月都互相写信。
 Liǎngrén měi yuè dōu hùxiāng xiě xìn.
 二人は毎月手紙を交換しています。
 Futari-wa maituki tegami-o kookan-siteimasu.

30. a. Ann got angry and hit Mark.
 周莉莉很生气，打了阿伟。
 Zhōulili hěn shēngqì, dǎle Āwěi.
 理恵さんは怒って隆君をたたきました。
 Rie-san-wa okotte Takashi-kun-o tatakimasita.

- [continue] b. She/Ann hated liars.
 ø/她/周莉莉非常讨厌说谎的人。
 ø/Tā/Zhōulili fēicháng tǎoyàn shuōhuǎng de rén.
 ø/彼女は/理恵さんは嘘をつく人が大嫌いでした。
 ø/Kanozyo-wa/Rie-san-wa uso-o tukupito-ga daikiraidesita.

- [shift] b'. He/Mark was surprised because it happened so suddenly.
 因为来的太快，ø/他/阿伟吓呆了。
 Yīnwèilái de tài kuài, ø/tā/Āwěi xiàdāi le.
 突然に起こったので、ø/彼は/隆君は驚きました。
 Totuzen-ni okotta-node, ø/kare-wa/Takashi-kun-wa odorokimasita.

- c. Fights can happen even between two good friends.
 矛盾在好朋友之间也会发生。
 Máodùn zài hǎo péngyou zhī jiān yě huì fāshēng.
 喧嘩は仲の良い友達の間でも起こります。
 Kenka-wa naka-no yoi tomodati-no aida-demo okorimasu.

31. a. Bob waited for Kate at a café.
 李小虎在咖啡店等刘敏。
 Lǐxiǎohǔ zài kāfēi diàn děng Liúmǐn.
 直樹君はカフェで綾さんを待ちました。
 Naoki-kun-wa kafe-de Aya-san-o matimasita.

- [continue] b. He/Bob had a hot caramel latte.
 ø/他/李小虎喝了一杯拿铁咖啡。
 ø/Tā/Lǐxiǎohǔ hēle yībēi ná tiě kāfēi.
 ø/彼は/直樹君は温かいキャラメルラテを飲みました。
 ø/Kare-wa/Naoki-kun-wa atatakai kyaramerurate-o nomimasita.

[shift] b'. She/Kate said on the phone, "Sorry for being late! The parking is full now."
 ø/她/刘敏在电话上说道：“不好意思，迟到了，停车场现在满了”。
 ø/Tā/Liúmǐn zài diànhuà shàng shuōdào, “Bù hǎoyìsi, chídàole, tǐngchē chǎng xiànzài mǎnle”.
 ø/彼女は/綾さんは電話で「遅れてごめん、今駐車場がいっぱいで」と言いました。
 ø/Kanozyo-wa/Aya-san-wa denwa-de “Okurete gomen, ima tyuusyazyoo-ga ippaide”-to iimasita.

c. Later, they met and chatted for a long time.
 之后，他们见了面，谈了很长时间。
 Zhīhòu, tāmen jiànle miàn, tánle hěn cháng shíjiān.
 その後、彼らは会って長い間話しました。
 Sonogo, karera-wa atte nagaiaida hanasimasita.

32. a. Paul paid 50 dollars to Grace.
 阿强付 50 美金给徐珍珍。
 Āqiáng fù 50 měijīn gěi Xúzhēnzhēn.
 誠君は由香さんに 50 ドルを支払いました。
 Makoto-kun-wa Yuka-san-ni 50-doru-o siharaimasita.

[continue] b. He/Paul mailed the check at the post office yesterday.
 ø/他/阿强昨天在邮局寄了支票。
 ø/Tā/Āqiáng zuótīān zài yóujú jìle zhīpiào.
 ø/彼は/誠君は昨日郵便局で小切手を郵送しました。
 ø/Kare-wa/Makoto-kun-wa kinoo yuubinkyoku-de kogitte-o yuusoo-simasita.

[shift] b'. She/Grace bought a new watch with the money.
 ø/她/徐珍珍用那个钱购买了一只新手表。
 ø/Tā/Xúzhēnzhēn yòng nàge qián gòumǎile yì zhī xīn shǒubiǎo.
 ø/彼女は/由香さんはそのお金で新しい時計を買いました。
 ø/Kanozyo-wa/Yuka-san-wa sono-okane-de atarasii tokei-o kaimasita.

c. Money is sometimes exchanged between friends.
 朋友之间有时候也会产生金钱交易。
 Péngyou zhī jiān yǒu shíhòu yě huì chǎnshēng jīnqián jiāoyì.
 お金は時々友達間でもやりとりされます。
 Okane-wa tokidoki tomodatikan-demo yaritori-saremasu.

33. a. Ann interviewed Mark for a class assignment.
 周莉莉因为课堂作业而采访了阿伟。
 Zhōulili yīnwèi kètáng zuòyè ér cǎifǎng Āwēi.
 理恵さんは授業課題のため、隆君にインタビューしました。
 Rie-san-wa zyugyookadai-no tame, Takashi-kun-ni intabyuu-simasita.

[continue] b. She/Ann wanted to know people's opinions about TV programs.
 ø/她/周莉莉想了解大家关于电视节目的看法。
 ø/Tā/Zhōulìlì xiǎng liǎojiě dàjiā guānyú diànshì jiémù de kànfǎ.
 ø/彼女は/理恵さんはテレビ番組に関するみんなの意見を知りたかったのです。
 ø/Kanozyo-wa/Rie-san-wa terebibangumi-ni kansuru minna-no iken-o siritakattanodesu.

[shift] b'. He/Mark answered a few questions about TV programs.
 ø/他/阿伟回答了关于电视节目的几个问题。
 ø/Tā/Āwěi huídále guānyú diànshì jiémù de jǐ gè wèntí.
 ø/彼は/隆君はテレビ番組に関するいくつかの質問に答えました。
 ø/Kare-wa/Takashi-kun-wa terebibangumi-ni kansuru ikutuka-no situmon-ni kotaemasita.

c. Most people watch TV for at least an hour a day.
 大部分的人一天要看一个小时以上的电视。
 Dà bùfēn de rén yìtiān yào kàn yí gè xiǎoshí yǐshàng de diànshì.
 たいていの人は一日一時間以上テレビを見ます。
 Taitei-no hito-wa itiniti itizikan-izyoo terebi-o mimasu.

34. a. Kate sold a car to Bob.
 刘敏卖了辆车给李小虎。
 Liúmǐn màile liàng chē gěi Lǐxiǎohǔ.
 綾さんは直樹君に車を売りました。
 Aya-san-wa Naoki-kun-ni kuruma-o urimasita.

[continue] b. She/Kate offered the old model at a very low price.
 ø/她/刘敏以很便宜的价格出售了那款老车。
 ø/Tā/Liúmǐn yǐ hěn piányi de jiàgé chūshòule nà kuǎn lǎo chē.
 ø/彼女は/綾さんはその古いモデルを激安価格で提供しました。
 ø/Kanozyo-wa/Aya-san-wa sono furui moderu-o gekiyasukakaku-de teekyoo-simasita.

[shift] b'. He/Bob was happy to get the old model at a very low price.
 ø/他/李小虎很高兴以低廉的价格买到了那款老车。
 ø/Tā/Lǐxiǎohǔ hěn gāoxìng yǐ dīlián de jiàgé mǎi dào le nà kuǎn lǎo chē.
 ø/彼は/直樹君はその古いモデルを激安価格で手に入れ、喜びました。
 ø/Kare-wa/Naoki-kun-wa sono furui moderu-o gekiyasukakaku-de teniire, yorokobimasita.

c. Many young people cannot buy an expensive car.
 很多年轻人买不起高档车。
 Hěnduō niánqīng rén mǎi bù qǐ gāodàng chē.
 多くの若者は高価な車が買えません。
 Ooku-no wakamono-wa kooka-na kuruma-ga kaemasen.

35. a. Bob mailed a box to Kate.
李小虎寄了一个大箱子给刘敏。
Lǐxiǎohǔ jìle yí gè dà xiāngzi gěi Liúmǐn.
直樹君は綾さんに大きな箱を郵送しました。
Naoki-kun-wa Aya-san-ni ookina hako-o yuusoo-simasita.
- [continue] b. He/Bob bought a tennis racket as a present.
ø/他/李小虎买了一个网球拍作为礼物。
ø/Tā/Lǐxiǎohǔ mǎile yí gè wǎngqiú pāi zuòwéi lǐwù.
ø/彼は/直樹君はプレゼントとしてテニスのラケットを買いました。
ø/Kare-wa/Naoki-kun-wa purezento-tosite tenisu-no raketto-o kaimasita.
- [shift] b'. She/Kate quickly opened the box and picked up the new tennis racket.
ø/她/刘敏马上拆开看，取出了一只崭新的网球拍。
ø/Tā/Liúmǐn mǎshàng chāi kāi kàn qǔchūle yì zhī zhǎnxīn de wǎngqiú pāi.
ø/彼女は/綾さんは素早く箱を開け、新品のテニスラケットを取り出しました。
ø/Kanozyo-wa/Aya-san-wa subayaku hako-o ake, sinpin-no tenisuraketto-o toridasimasita.
- c. They are both college tennis players.
他们都是大学的网球选手。
Tāmen dōu shì dàxué de wǎngqiú xuǎnshǒu.
彼らは二人とも大学のテニスプレーヤーです。
Karera-wa futaritomo daigaku-no tenisupureeyaa-desu.

Items 36–45 were used only in Experiments 1B (Chinese) and 1C (Japanese)

36. a. Paul announced yesterday's game results to Grace.
王大明把昨天的比赛结果告诉了张娟。
Wángdà míng bǎ zuótiān de bǐsài jiēguǒ gàosù le Zhāngjuān.
健太君は舞さんに昨日の試合結果を伝えました。
Kenta-kun-wa Mai-san-ni kinoo-no siai kekka-o tutaemasita.
- [continue] b. He/Paul won the important tennis tournament.
ø/他/王大明拿到了那个网球比赛的冠军。
ø/Tā/Wángdà míng ná dào le nà ge wǎngqiú bǐsài de guànjūn.
ø/彼は/健太君はその大事なテニスのトーナメントで優勝しました。
ø/Kare-wa/Kenta-kun-wa sono daizi-na tenisu-no toonamento-de yuusyoosimasita.
- [shift] b'. She/Grace was very happy about the good news.
ø/她/张娟对那个喜讯感到非常高兴。
ø/Tā/Zhāngjuān duì nà ge xǐxùn gǎndào fēicháng gāoxìng.
ø/彼女は/舞さんはその良いニュースにとっても喜びました。
ø/Kanozyo-wa/Mai-san-wa sono-yoinyusu-ni totemo yorokobimasita.

- c. They went to a bar to celebrate the victory.
他们一起去酒吧庆祝了胜利。
Tāmen yìqǐ qù jiǔbā qìngzhùle shènglì.
彼らはその勝利を祝うために、近くのバーへ行きました。
Karera-wa sono-syoori-o iwau-tameni, tikaku-no baa-e ikimasita.

37. a. Tom invited Jane to a rock concert.
阿强邀请了徐珍珍去摇滚音乐会。
Āqiáng yāoqǐngle Xúzhēnzhēn qù yáogǔn yīnyuè huì.
誠君は由香さんをロックのコンサートに誘いました。
Makoto-kun-wa Yuka-san-o rokku-no konsaato-ni sasoimasita.

- [continue] b. This was because he/Tom had one extra ticket.
因为 ø/他/阿强手上有一张多余的票。
Yīnwèi ø/tā/Āqiáng shǒu shàng yǒu yì zhāng duōyú de piào.
ø/彼は/誠君は一枚チケットを余分に持っていたからです。
ø/Kare-wa/Makoto-kun-wa itimai-no tiketto-o yobun-ni motteita-kara-desu.

- [shift] b'. But she/Jane wasn't interested and said, "No thanks."
但是, ø/她/徐珍珍兴趣, 并说“真的不需要了”。
Dànshì, ø/tā/Xúzhēnzhēn xìngqù, bìng shuō “Zhēn de bù xūyào.”
でも ø/彼女は/由香さんは興味がなくて、「いらない」と言いました。
Demo ø/kanozyo-wa/Yuka-san-wa kyoomi-ga nakute, “Iranai”-to iimasita.

- c. The band plays a concert in Hawaii every summer.
那个乐队每年夏天都会在夏威夷开音乐会。
Nàge yuèduì měinián xiàtiān dōuhuì zài xiàwēiyí kāi yīnyuè huì.
そのバンドは毎年夏にハワイでコンサートを行います。
Sono-bando-wa maitosi natu-ni hawai-de konsaato-o okonaimasu.

38. a. Mark asked Ann for directions to downtown.
阿伟向周莉莉询问到市中心的路线。
Āwěi xiàng Zhōulìlì xúnwèn dào shì zhōngxīn de lùxiàn.
隆君は理恵さんにダウンタウンへの道を尋ねました。
Takashi-kun-wa Rie-san-ni dauntaun-eno miti-o tazunemasita.

- [continue] b. He/Mark wanted to go to a large bookstore.
ø/他/阿伟想去一家很大的书店。
ø/Tā/Āwěi xiǎng qù yìjiā hěn dà de shūdiàn.
ø/彼は/隆君は大きな本屋に行きたかったのです。
ø/Kare-wa/Takashi-kun-wa ookina honya-ni ikitakattanodesu.

[shift] b'. But unfortunately she/Ann couldn't help.
 但可惜的是, ø/她/周莉莉不能帮上忙。
 Dàn kěxī de shì, ø/tā/Zhōulili bùnéng bāng shàng máng.
 でも残念ながら、ø/彼女は/理恵さんは助けになれませんでした。
 Demo zannen-nagara, ø/kanozyo-wa/Rie-san-wa tasuke-ni naremasendesita.

c. The streets around here are so complex.
 这附近的路都非常复杂。
 Zhè fùjìn de lù dōu fēicháng fùzá.
 この辺りの道はとても入り組んでいます。
 Kono-atari-no miti-wa totemo irikundeimasu.

39. a. Paul brought a souvenir for Grace.
 王大明带了份纪念品给张娟。
 Wángdà míng dài le fēn jìniànpǐn gěi Zhāngjuān.
 健太君は舞さんにおみやげを届けました。
 Kenta-kun-wa Mai-san-ni omiyage-o todokemasita.

[continue] b. He/Paul just came back from Switzerland.
 ø/他/王大明刚刚从瑞士回来。
 ø/Tā/Wángdà míng gāngāng cóng ruìshì huí lái.
 ø/彼は/健太君はスイスから戻ってきたばかりです。
 ø/Kare-wa/Kenta-kun-wa suisu-kara modotte kita-bakaridesu.

[shift] b'. Then she/Grace smiled and said, "Thank you."
 然后, ø/她/张娟笑了笑, 说: “谢谢!”。
 Ránhòu, ø/tā/Zhāngjuān xiàole xiào, shuō “Xièxiè!”
 すると、ø/彼女は/舞さんはニッコリして「ありがとう」と言いました。
 Suruto, ø/kanozyo-wa/Mai-san-wa nikkori-site “Arigatoo”-to iimasita.

c. There was a cool watch in the bag.
 袋子里装有一个很酷的手表。
 Dàizi lǐ zhuāng yǒu yí gè hěn kù de shǒubiǎo.
 袋の中にかっこいい時計が入っていました。
 Fukuro-no naka-ni kakkoi tokee-ga haitteimasita.

40. a. Grace walked toward Paul during a party.
 张娟在聚会时候朝着王大明走去。
 Zhāngjuān zài jùhuì shíhòu cháo zhe Wángdà míng zǒu qù.
 舞さんはパーティの最中、健太君の方へ歩いていきました。
 Mai-san-wa paathii-no saityuu, Kenta-kun-no hoo-e aruiteikimasita.

[continue] b. She/Grace wanted to talk about a funny story.
 ø/她/张娟想告诉一件有趣的事。
 ø/Tā/Zhāngjuān xiǎng gāosu yí jiàn yǒuqù de shì.
 ø/彼女は/舞さんはとても面白い話をしたかったです。
 ø/Kanozyo-wa/Mai-san-wa totemo omosiroi hanasi-o sitakattanodesu.

[shift] b'. Then he/Paul stopped dancing and smiled.
 然后, ø/他/王大明停下舞步, 脸上露出微笑。
 Ránhòu, ø/tā/Wángdà míng tíng xià wǔbù, liǎn shàng lùchū wēixiào.
 すると ø/彼は/健太君は踊るのをやめて、微笑みかけました。
 Suruto ø/kare-wa/Kenta-kun-wa odoruno-o yamete, hohoemikakemasita.

c. They kept talking for 30 minutes.
 他们连续谈了 30 分钟。
 Tāmen liánxù tánle 30 fēnzhōng.
 彼らは 30 分間話し続けました。
 Karera-wa 30-punkan hanasi-tuzukemasita.

41. a. Ann gave a ride to Mark.
 周莉莉让阿伟搭乘自己的车。
 Zhōulilì ràng Āwěi dāchéng zìjǐ de chē.
 理恵さんは隆君を車に乗せました。
 Rie-san-wa Takashi-kun-o kuruma-ni nosemasita.

[continue] b. She/Ann was driving a small red car.
 ø/她/周莉莉开的是一辆红色的小汽车。
 ø/Tā/Zhōulilì kāi de shì yí liàng hóng sè de xiǎo qìchē.
 ø/彼女は/理恵さんは小さな赤い車を運転していました。
 ø/Kanozyo-wa/Rie-san-wa tiisana akai kuruma-o unten-siteimasita.

[shift] b'. He/Mark said "Thank you!" and jumped in the car.
 ø/他/阿伟说了声: “谢谢!”, 然后就跳上了车。
 ø/Tā/Āwěi shuōle shēng “Xièxie!”, ránhòu jiù tiào shàngle chē.
 ø/彼は/隆君は「ありがとう!」と言って車に飛び乗りました。
 ø/Kare-wa/Takashi-kun-wa “Arigatoo!”-to itte kuruma-ni tobinorimasita.

c. They arrived at school around 9 am.
 早上 9 点左右到了学校。
 Zǎoshang 9 diǎn zuǒyòu dào le xuéxiào.
 午前 9 時頃学校に到着しました。
 Gozen 9-zi-goro gakkoo-ni tootyaku-simasita.

42. a. Kate showed a picture to Bob.
 刘敏给李小虎看了张照片。
 Liúmǐn gěi Lǐxiǎohǔ kànle zhāng zhàopiàn.
 綾さんは直樹君に一枚の写真を見せました。
 Aya-san-wa Naoki-kun-ni itimai-no syasin-o misemasita.
- [continue] b. She/Kate thought the child's face looked so funny.
 ø/她/刘敏觉得那个小孩的脸看起来十分好笑。
 ø/Tā/Liúmǐn juéde nàge xiǎohái de liǎn kàn qǐlái shífēn hǎoxiào.
 ø/彼女は/綾さんはその子供の顔がすごく面白いと思ったのです。
 ø/Kanozyo-wa/Aya-san-wa sono-kodomo-no kao-ga sugoku omosiroi-to omottanodesu.
- [shift] b'. He/Bob looked at the child's funny face and started to laugh.
 ø/他/李小虎一看到那个小孩的脸就笑了起来。
 ø/Tā/Lǐxiǎohǔ yí kàn dào nàge xiǎohái de liǎn jiù xiàole chūlái.
 ø/彼は/直樹君はその子供の顔を見て笑い出しました。
 ø/Kare-wa/Naoki-kun-wa sono-kodomo-no kao-o mite waraidasimasita.
- c. There was tomato sauce all over his face.
 整个脸都粘满了番茄酱。
 Zhěng gè liǎn dōu zhān mǎnle fānqié jiàng.
 顔中にトマトソースが付いていました。
 Kaozyuu-ni tomatosoosu-ga tuiteimasita.
43. a. Jane ignored Tom.
 徐珍珍装作没看见阿强。
 Xúzhēnzhēn zhuāng zuò méi kànjiàn Āqiáng.
 由香さんは誠君を無視しました。
 Yuka-san-wa Makoto-kun-o musu-simasita.
- [continue] b. She/Jane was still mad from yesterday's fight.
 ø/她/徐珍珍还在生昨天的气。
 ø/Tā/Xúzhēnzhēn huán zài shēng zuótiān de qì.
 ø/彼女は/由香さんはまだ昨日の喧嘩のことで怒っていました。
 ø/Kanozyo-wa/Yuka-san-wa mada kinoo-no kenka-no koto-de okotteimasita.
- [shift] b'. He/Tom was hurt and almost cried.
 ø/他/阿强很伤心，快要哭出来了。
 ø/Tā/Āqiáng hěn shāngxīn, kuàiyào kū chūlái.
 ø/彼は/誠君は傷ついて泣きそうになりました。
 ø/Kare-wa/Makoto-kun-wa kizutuite nakisooni narimasita.

- c. The broken relationship needs a little more time to heal.
 关系的修复是需要一些时间的。
 Guānxi de xiūfù shì xūyào yìxiē shíjiān de.
 壊れた関係を修復するには、もう少し時間が必要です。
 Kowareta kankee-o syuufuku-suru-niwa, moosukosi zikan-ga hituyoodesu.

44.

- a. Kate beat Bob on a Wii game.
 刘敏打电子游戏赢了李小虎。
 Liúmǐn dǎ diànzǐ yóuxì yíngle Lǐxiǎohǔ.
 綾さんはWiiのゲームで直樹君に勝ちました。
 Aya-san-wa Wii-no geemu-de Naoki-kun-ni katimasita.

- [continue] b. She/Kate was good at all kinds of video games.
 ø/她/刘敏不管玩什么游戏都很厉害。
 ø/Tā/Liúmǐn bùguǎn wán shénme yóuxì dōu hěn lihai.
 ø/彼女は/綾さんはどのテレビゲームでも得意でした。
 ø/Kanozyo-wa/Aya-san-wa dono terebigeemu-demo tokui-desita.

- [shift] b'. He/Bob was disappointed and wanted to play one more time.
 ø/他/李小虎非常气馁，想再玩一次。
 ø/Tā/Lǐxiǎohǔ fěicháng qìněi, xiǎng zài wán yíci.
 ø/彼は/直樹君はがっかりし、もう一度やりたと思いました。
 ø/Kare-wa/Naoki-kun-wa gakkarisi, mooitido yaritai-to omoimasita.

- c. They decided to compete again next week.
 他们决定下周再来比一次。
 Tāmen juédìng xià zhōu zàiláibǐ yíci.
 彼女達はまた来週競争することにしました。
 Kanozyotati-wa mata raisyuu kyoosoo-suru-koto-ni simasita.

45.

- a. Paul cheered up Grace.
 王大明鼓励张娟。
 Wángdà míng gǔ lì Zhāngjuān.
 健太君は舞さんを元気づけました。
 Kenta-kun-wa Mai-san-o genkizukemasita.

- [continue] b. He/Paul smiled and made some funny jokes.
 ø/他/王大明笑着讲了几个笑话。
 ø/Tā/Wángdà míng xiào zhe jiǎngle jǐ gè xiàohuà.
 ø/彼は/健太君は笑っていくつか冗談を飛ばしました。
 ø/Kare-wa/Kenta-kun-wa waratte ikutuka zyoodan-o tobasimasita.

- [shift] b'. A few minutes later, she/Grace stopped crying.
 几分钟后, ø/她/张娟不哭了。
 Jǐfēn zhōng hòu, ø/tā/Zhāngjuān bù kūle.
 数分後、ø/彼女は/舞さんは泣き止みました。
 Suufungo, ø/kanozyo-wa/Mai-san-wa nakiyamimasita.
- c. It's good to be around positive people.
 身边有乐观的人陪伴是幸福的。
 Shēnbiān yǒu lèguān de rén péibàn shì xìngfú de.
 ポジティブな人の周りにいるのはいいことです。
 Pozithibu-na hito-no mawari-ni iru-nowa iikoto-desu.

Filler items

1. a. The high school teacher took her students to the museum.
 高中老师带着她的学生去了博物馆。
 Gāozhōng lǎoshī dài zhe tā de xuéshēng qù le bówùguǎn.
 高校の先生が生徒達を博物館に連れて行きました。
 Kookoo-no sensee-ga seitotati-o hakubutukan-ni tureteikimasita.
 - b. There were some painting from Europe.
 那里有一些欧洲的画作。
 Nà lǐ yǒu yìxiē ōuzhōu de huàzuò.
 そこにはヨーロッパの絵画がいくつかありました。
 Sokoniwa yooroppa-no kaiga-ga ikutuka arimasita.
 - c. The students were impressed by the art work.
 学生们都被这些艺术作品所打动了。
 Xuéshēngmen dōu bèi zhèxiē yìshù zuòpǐn suǒ dǎdòng le.
 生徒達はその芸術作品に感動しました。
 Seitotati-wa sono-geizyutusakuhin-ni kandoo-simasita.
2. a. The photographer was in the studio with a politician.
 摄影师和一名政客在摄影棚里。
 Shèyǐng shī hé yī míng zhèngkè zài shèyǐng péng lǐ.
 カメラマンが政治家と写真スタジオにいました。
 Kameraman-ga seezika-to syasinsutazio-ni imasita.
 - b. Some staff members were preparing for the photo shoot.
 几名工作人员正在做摄影前的准备工作。
 Jǐ míng gōngzuò rényuán zhèngzài zuò shèyǐng qián de zhǔnbèi gōngzuò.
 何人かのスタッフが撮影の準備をしていました。
 Nannin-ka-no sutaffu-ga satuee-no zyunbi-o siteimasita.

- c. The pictures will be used for a magazine next month.
 那些照片下个月将刊登在某个杂志上。
 Nàxiē zhàopiàn xià gè yuè jiāng kāndēng zài mǒu gè zázhi shàng.
 その写真は、来月ある雑誌で使われる予定です。
 Sono-syasin-wa raigetū aruzassi-de tukawareru yoteedesu.
3. a. The doctor called the nurse sitting at the front desk.
 医生叫来了坐在前台的护士。
 Yīshēng jiào láile zuò zài qiántái de hùshi.
 医者が受付に座っていた看護婦を呼びました。
 Isya-ga uketuke-ni suwatteita kangofu-o yobimasita.
- b. Some documents were necessary to examine the sick child.
 为了检查小孩的病，几样文件必须齐全。
 Wèile jiǎnchá xiǎohái de bìng jǐ yàng wénjiàn bìxū qíquán.
 病気の子供を診察するために、いくつか資料が必要でした。
 Byooki-no kodomo-o sinsatusuru-tame-ni ikutuka siryoo-ga hituyoodesita.
- c. The nurse helped the doctor right away.
 护士随即帮助了那位医生。
 Hùshi suíjí bāngzhùle nà wèi yīshēng.
 看護婦はすぐにその医者の手伝いをしました。
 Kangofu-wa suguni sono-isyā-no tetudai-o simasita.
4. a. The singer played golf with a comedian last week.
 上周，某歌手和喜剧演员打了高尔夫球。
 Shàng zhōu, mǒu gēshǒu hé xǐjù yǎnyuán dǎle gāoěrfū qiú.
 先週、ある歌手がお笑い芸人とゴルフをしました。
 Sensyuu aru-kasyu-ga owaraigeenin-to gorufu-o simasita.
- b. It was a competition for a TV show.
 那是一个电视节目的策划。
 Nà shì yīgè diànshì jìemù de cèhuà.
 それはテレビ番組のための企画でした。
 Sore-wa terebi-bangumi-no tame-no kikakudesita.
- c. The singer won \$1000 as a prize.
 那位歌手拿到了 1 万人民币的奖金。
 Nà wèi gēshǒu ná dào le 1 wàn rénminbì de jiǎngjīn.
 その歌手は賞金 10 万円を手に入れました。
 Sono-kasyu-wa syookin 10-manen-o teniiremasita.

5. a. The pilot was watching the news at the airport.
 飞行员在机场看新闻。
 Fēixíngyuán zài jīchǎng kàn xīnwén.
 パイロットが空港でニュースを見ていました。
 Pairotto-ga kuukoo-de nyuusu-o miteimasita.
- b. The weather forecast said it would start snowing soon.
 天气预报说马上会下雪。
 Tiānqì yùbào shuō mǎshàng huì xià xuě.
 天気予報でもうすぐ雪が降り始めると言いました。
 Tenkiyoo-de moosugu yuki-ga furihazimeru-to iimasita.
- c. Later that day, the airport was closed.
 几小时之后，因为天气的原因，机场封锁了。
 Jǐ xiǎoshí zhīhòu, yīn wèi tiānqì de yuányīn, jīchǎng fēngsuǒle.
 数時間後、天候のためその空港は閉鎖されました。
 Suuzikan-go tenkoo-no tame sono-kuukoo-wa heisa-saremasita.
6. a. The young chef created some delicious desserts.
 年轻的厨师做了一些美味的点心。
 Niánqīng de chúshī zuòle yīxiē měiwèi de diǎnxīn.
 若いシェフが美味しいデザートをいくつか作りました。
 Wakai shefu-ga oisii dezaato-o ikutuka tukurimasita.
- b. The guests at the restaurant really liked the chocolate cake.
 那个餐厅的顾客们都很喜欢巧克力蛋糕。
 Nàge cāntīng de gùkèmen dōu hěn xǐhuan qiǎokèlì dàngāo.
 そのレストランのお客さん達は、チョコレートケーキがとても気に入りました。
 Sono-resutoran-no okyakusantati-wa tyokoreetokeeki-ga totemo kiniirimasita.
- c. The chef got a lot of positive feedback that day.
 那天那位厨师得到了很高的评价。
 Nàtiān nà wèi chúshī dédàole hěn gāo de píngjià.
 その日、そのシェフは多くの高い評価を得ました。
 Sono-hi sono-shefu-wa ooku-no takai hyooka-o emasita.
7. a. The professional runner just finished a 10 km race.
 职业运动员刚才跑完了十公里。
 Zhíyè yùndòngyuán gāngcái pǎo wánle shí gōnglǐ.
 プロのランナーがさっき 10 km のレースを終えました。
 Puro-no rannaa-ga sakki 10-kiro-no reesu-o oemasita.

- b. The coaches were excited and said “good job!”
 教练们都非常兴奋的说：“非常好！”
 Jiàoliànmen dōu fēicháng xīngfèn de shuō “fēicháng hǎo!”
 コーチ陣はとても喜び、「よくやったぞ！」と言いました。
 Kooti-jin-wa totemo yorokobi “yokuyattazo”-to iimasita.
- c. The runner received a gold medal at the ceremony.
 那个运动员在颁奖仪式上拿到了金牌。
 Nàge yùndòngyuán zài bānjiǎng yíshì shàng ná dào le jīnpái.
 そのランナーはセレモニーで金メダルを受け取りました。
 Sono-rannaa-wa seremonii-de kinmedaru-o uketorimasita.
8. a. The policeman stopped a car in the narrow street.
 警察在小巷里逼停了一辆汽车。
 Jǐngchá zài xiǎo xiàng lǐ bī tíng le yī liàng qìchē.
 警察官が狭い通りで一台の車を止めました。
 Keisatukan-ga semai toori-de itidai-no kuruma-o tomemasita.
- b. The driver seemed to be drunk.
 那个司机好像是醉酒驾驶。
 Nàge sījī hǎoxiàng shì zuìjiǔ jiàshǐ.
 その運転手は酒で酔っているようでした。
 Sono-untensyu-wa sake-de yotteiruyoudesita.
- c. Luckily, nobody was hurt.
 幸好，谁也没受伤。
 Xìnghǎo, shéi yě méi shòushāng.
 幸い、誰も怪我をせずにすみしました。
 Saiwai dare-mo kega-o sezuni sumimasita.
9. a. The French guy sent out an email the other day.
 前些天，一个法国男人发了封邮件。
 Qián xiē tiān, yīgè fǎguó nánrén fā le fēng yóujiàn.
 先日、フランス人の男性がEメールを送りました。
 Senzitu furansuzin-no dansee-ga E-meeru-o okurimasita.
- b. The message was about a college party next Friday.
 那封邮件是关于下周五在大学里的聚会。
 Nà fēng yóujiàn shì guānyú xià zhōu wǔ zài dàxué lǐ de jùhuì.
 そのメールは、来週金曜日にある大学でのパーティについてでした。
 Sono-meeru-wa raisyuu kinyoobi-ni aru daigaku-deno paathii-nituite desita.

- c. \$25 is required for food and drinks.
食物加飲料一共要收 100 元。
Shíwù jiā yǐnliào yīgòng yào shōu 100 yuán.
飲食代として 25 ドル徴収されます。
Insyokudai-tosite 25-doru tyoosyuu-saremasu.
10. a. The mother bought a pair of earrings at a store.
有一个妈妈在店里买了一对耳环。
Yǒu yīgè māma zài diàn lǐ mǎile yī duì ěrhuán.
ある母親が店でイヤリングを買いました。
Aru hahaoya-ga mise-de iyaringu-o kaimasita.
- b. The jewelry was a birthday present for her daughter.
那个饰品是给她女儿的生日礼物。
Nàge shìpǐn shì gěi tā nǚér de shēngrì lǐwù.
そのジュエリーは娘への誕生日プレゼントでした。
Sono-zyuerii-wa musume-eno tanzyoobipurezento-desita.
- c. Later, the mother also bought a cute birthday card.
之后，那个妈妈又买了张可爱的生日卡片。
Zhīhòu, nàge māma yòu mǎile zhāng kě'ài de shēngrì kǎpiàn.
その後、その母親はかわいいバースデーカードも買いました。
Sono-go sono-hahaoya-wa kawaii baasudeekaado-mo kaimasita.
11. a. The surfer suddenly shouted, “There’s a big shark in the water!”
冲浪的人突然大声叫道，“这里有只大鲨鱼。”
Chōnglàng de rén tūrán dàshēng jiào dào, zhè lǐ yǒu zhī dà shāyú.
サーファーが突然、「ここに大きなサメがいるぞ！」と叫びました。
Saafaa-ga totuzen “koko-ni ookina same-ga iruzo”-to sakebimasita.
- b. The kids playing there got very scared.
在那附近玩耍的孩子们都吓坏了。
Zài nà fùjìn wánshuǎ de hái zimen dōu xià huàile.
その辺りで遊んでいた子供達は、とても怖がりました。
Sono-mawari-de asondeita kodomotati-wa totemo kowagarimasita.
- c. The lifeguards warned the people immediately.
救生员们立即警告了在那附近的人。
Jiùshēng yuánmen lìjí jǐnggào le zài nà fùjìn de rén.
ライフセーバーはすぐにその辺りにいる人達に警告しました。
Raifuseebaa-wa sugu-ni sono-atari-ni-iru hitotati-ni keikokusimasita.

12. a. The old lady was reading a long novel.
老妇人读了一篇长篇小说。
Lǎo fù rén dúle yì piān chángpiān xiǎoshuō.
おばあさんが長編小説を読んでいました。
Obaasan-ga tyoohensyoosetu-o yondeimasita.
- b. The story was about a man's adventure on an island.
故事是关于一个男子在岛上的历险记。
Gùshi shì guānyú yí gè nánzǐ zài dǎo shàng de lìxiǎn jì.
それはある男の島での冒険の話でした。
Sore-wa aru-otoko-no shima-deno booken-no hanasi-desita.
- c. It took an entire month to finish the book.
读完那本书花了整整一个月的时间。
Dú wán nà běn shū huāle zhěngzhěng yí gè yuè de shíjiān.
その本を読み終えるのに丸1ヶ月かかりました。
Sono-hon-o yomioeru-noni maru-ikkagetu kakarimasita.
13. a. Tom took his little sister to the movie theater.
阿强带着他年幼的妹妹到了电影院。
Āqiáng dài zhe tā nián yòu de mèimei dào le diànyǐngyuàn.
誠君は幼い妹を映画館に連れて行きました。
Makoto-kun-wa osanai imooto-o eegakan-ni tureteikimasita.
- b. There was a long line of children at the ticket window.
那里有很多小朋友排在售票窗口前。
Nà lǐ yǒu hěnduō xiǎopéngyǒu pái zài shòupiào chuāngkǒu qián.
チケット窓口には子供の長い列ができていました。
Tiketto-madoguti-niwa kodomo-no nagai retu-ga dekiteimasita.
- c. Everyone was excited to see the new Disney movie.
每个人都期待看那部最新的迪斯尼动画片。
Měi gè rén dōu hěn qīdài kàn nà bù zuìxīn de dísiní dònghuà piàn.
みんな新しいディズニー映画を見るのにワクワクしていました。
Minna atarasii dizunii-eiga-o miru-noni wakuwaku siteimasita.
14. a. Jane wanted to have fun after eating at McDonald's with her friends.
在麦当劳吃完饭后，徐珍珍和朋友们都很想去哪里玩一下。
Zài màidāngláo chī wán fàn hòu Xúzhēnzhēn hé péngyoumen dōu hěn xiǎng qù nǎlǐ wán yíxià.
由香さんは友達とマクドナルドで食べた後、どこかで遊びたいと思いました。
Yuka-san-wa tomodati-to makudonarudo-de tabeta ato dokoka-de asobitai-to omoimasita.

- b. Luckily, there was a karaoke place across the street.
碰巧，街对面就有一家唱歌的地方。
Pèngqiǎo jiē duìmiàn jiù yǒu yìjiā chànggē de dìfāng.
運良く、通りの向こう側にカラオケボックスがありました。
Unyoku toori-no mukoo-gawa-ni karaokebokkusu-ga arimasita.
- c. They all enjoyed singing for 2 hours.
她们高兴的唱了两个小时。
Tāmen gāoxìng de chàngē liǎnggè xiǎoshí.
彼女達は2時間歌って楽しみました。
Kanozyotati-wa 2-zikan utatte tanosimimasita.
15. a. Mark and his classmates were walking outside.
阿伟和他的几个同学在外面散步。
Āwěi hé tā de jǐ gè tóngxué zài wàimiàn sànbù.
隆君はクラスメート数人と外を歩いていました。
Takashi-kun-wa kurasumeeto suunin-to soto-o aruiteimasita.
- b. One student took a picture of the beautiful sky with her camera.
有个同学用相机对着美丽的天空拍了一张照片。
Yǒu gè tóngxué yòng xiàngjī duìzhe měilì de tiānkōng pāile yì zhāng zhàopiàn.
そのうちの一人がカメラで綺麗な空の写真を撮りました。
Sonouti-no hitori-ga kamera-de kirei-na sora-no syasin-o torimasita.
- c. There was a rainbow in the clear blue sky.
湛蓝的天空中架着一道彩虹。
Zhànlán de tiānkōng zhōng jiàzhe yídào cǎihóng.
晴れ渡った青空に虹がかかっていた。
Harewatatta aozora-ni nizi-ga kakatteimasita.
16. a. Ann took her family to Florida last year.
周莉莉去年带着全家人去了佛罗里达。
Zhōulìlì qùnián dài zhe quánjiā rén qù le fúluólídá.
理恵さんは去年家族をフロリダに連れて行きました。
Rie-san-wa kyonen kazoku-o furorida-ni tureteikimasita.
- b. The hotel room cost over \$400 a night.
住的宾馆一晚要价 2000 元人民币。
Zhù de bīnguǎn yì wǎn yào jià 2000 yuán rénminbì.
そのホテルの部屋は一晩で4万円以上もしました。
Sono-hoteru-no heya-wa hitoban-de 4-manen izyoo-mo-simasita.

- c. It became a very expensive family trip.
 那趟家庭旅行变得格外昂贵。
 Nà tàng jiā tíng lǚ xíng biàn de gé wài áng guì.
 それはとても高い家族旅行になりました。
 Sore-wa totemo takai kazoku-ryokoo-ni narimasita.
17. a. The researcher contacted Tom by email.
 研究员用电子邮件联系上了阿强。
 Yánjiūyuán yòng diànzǐ yóujiàn liánxì shàngle Āqiáng.
 研究者が誠君にメールで連絡を取りました。
 Kenkyuusya-ga Makoto-kun-ni meeru-de renraku-o torimasita.
- b. A lot of human participants were needed for a medical study.
 一项医学上的研究需要很多人来当实验对象。
 Yí xiàng yīxué shàng de yánjiū xūyào hěnduō rén lái dāng shíyàn duìxiàng.
 医療の研究で多くの被験者が必要だったのです。
 Iryoo-no kenkyuu-de ooku-no hikenzya-ga hituyoo-dattanodesu.
- c. The study was conducted at a local hospital.
 那项研究是在当地的医院进行的。
 Nà xiàng yánjiū shì zài dāngdì de yīyuàn jìnxíng de.
 その研究は地元の病院で行われました。
 Sono-kenkyuu-wa zimoto-no byoo-in-de okonawaremasita.
18. a. The manager of the grocery store said “Hi” to Jane.
 超市的店长给徐珍珍打了声招呼。
 Chāoshì de diàn zhǎng gěi Xúzhēnzhēn dǎle shēng zhāohu.
 スーパーの店長が由香さんに「こんにちは」と言いました。
 Suupaa-no tentyoo-ga Yuka-san-ni “konnnitiwa”-to iimasita.
- b. The two have known each other for a long time.
 两人彼此已经认识了很多年了。
 Liǎng rén bǐcǐ yǐjīng rènshile hěnduō niánle.
 二人は長年の知り合いです。
 Futari-wa naganen-no siriai-desu.
- c. Later, Jane asked what was on sale that day.
 之后，徐珍珍询问了当天的特价商品。
 Zhīhòu, Xúzhēnzhēn xún wèn le dāngtiān de tèjià shāngpǐn.
 その後、由香さんはその日のセール品について尋ねました。
 Sonogo Yuka-san-wa sono-hi-no seeruhin-nituite tazunemasita.

19. a. The professor saw Bob at the campus cafeteria.
教授在学校食堂碰见了李小虎。
Jiàoshòu zài xuéxiào shítáng pèngjiànle Lìxiǎohǔ.
教授がキャンパスのカフェテリアで直樹君を見かけました。
Kyoozyu-ga kyanpasu-no kafeteria-de Naoki-kun-o mikakemasita.
- b. After getting lunch, the two went outside and discussed their project.
午饭后，两人就出去谈了一下他们的课题。
Wǔfàn hòu liǎng rén jiù chūqù tánle yíxià tāmen de kètí.
ランチの後、二人は外へ出てプロジェクトについて話し合いました。
Ranti-no ato futari-wa soto-e dete purozyekuto-nituite hanasiaimasita.
- c. It was a hot summer day.
那天夏日炎炎。
Nàtiān xià rì yányán.
それは暑い夏の日のことでした。
Sore-wa atui natu-no hi-no-koto-desita.
20. a. The lawyer emailed Ann about her student visa application.
律师给周莉莉发了封关于申请学生签证的邮件。
Lǚshī gěi Zhōulìlì fāle fēng guānyú shēnqǐng xuésheng qiānzhèng de yóujiàn.
弁護士が学生ビザの申請について、理恵さんにメールをしました。
Bengosi-ga gakuseebiza-no sinsee-nituite Rie-san-ni meeru-o simasita.
- b. There was a big mistake on her application form.
她的申请书里有一个很大的问题。
Tā de shēnqǐng shū lǐ yǒu yí gè hěn dà de wèntí.
申請用紙に大きな間違いがあったのです。
Sinseeoyoosi-ni ookina matigai-ga attanodesu.
- c. It took a long time to fix the error.
改正那个错误花了很长的时间。
Gǎizhèng nà gè cuòwù huāle hěn cháng de shíjiān.
その間違いを直すのに長い時間がかかりました。
Sono-matigai-o naosu-noni nagai zikan-ga kakarimasita.
21. a. The babysitter was scheduled to work for 5 hours.
有一个保姆本来计划工作五个小时。
Yǒu yí gè bǎomǔ běnlái jìhuà gōngzuò wǔ gè xiǎoshí.
あるベビーシッターは5時間働く予定でした。
Aru-bebiisittaa-wa 5-zikan hatarakuyotee-desita.

b. Luckily, the baby slept the entire time.
幸运的是，宝宝在那段时间里一直在睡觉。
Xīngyùn de shì bǎobǎo zài nà duàn shíjiān lǐ yìzhí zài shuìjiào.
運良く、赤ちゃんはその間ずっと眠っていました。
Unyoku akatyan-wa sono-aida zutto nemutteimasita.

c. It turned out to be a very easy job.
结果成了非常简单的工作。
Jiēguǒ chéngle fēicháng jiǎndān de gōngzuò.
とても簡単な仕事となりました。
Totemo kantan-na sigoto-to narimasita.

22. a. The computer programmer was working late at night.
电脑程序员一直工作到深夜。
Diànnǎo chéngxùyuán yìzhí gōngzuò dào shēnyè.
コンピュータープログラマーが夜遅くまで働いていました。
Konpyuutaa-proguramaa-ga yoruosoku-made hataraitemasita.
- b. The task had to be completed by the next day.
那项任务必须在第二天之前做完。
Nà xiàng rènwu bìxū zài dìèrtiān zhīqián zuò wán.
その仕事は次の日までに終わらせなければなりませんでした。
Sono-sigoto-wa tugi-no hi-madeni owarasenakereba-narimasendesita.
- c. The office was dark and quiet.
办公室里又黑又静。
Bàngōngshì lǐ yòu hēi yòu jìng.
オフィスは暗くて静かでした。
Ofisu-wa kuraku-te sizuka-desita.

23. a. The hip-hop dancer started practicing at home at 6 pm.
嘻哈舞者下午 6 点开始在家练舞。
Xīhā wǔ zhě xiàwǔ 6 diǎn kāishǐ zàijiā liàn wǔ.
ヒップホップダンサーが夕方 6 時に家で練習を始めました。
Hippuhoppu-dansaa-ga yuugata 6-zi-ni ie-de rensyuu-o hazimemasita.
- b. There was a big mirror in front of him.
面前放了一个很大的镜子。
Miànqián fàngle yíge hěn dà de jìngzi.
目の前に大きな鏡が置いてありました。
Me-no mae-ni ookina kagami-ga oitearimasita.

- c. The practice ended at 10 pm.
那次练习在晚上十点结束。
Nà cì liànxí zài wǎnshang shídiǎn jiéshù.
その練習は夜10時に終わりました。
Sono-rensyuu-wa yoru 10-zi-ni owarimasita.

24. a. The famous author was writing a romantic story.
名作家写了一个恋爱故事。
Míng zuòjiā xiěle yíge liànài gùshì.
有名な作家が恋愛物語を書いていました。
Yuume-e-na sakka-ga renaimonogatari-o kaiteimasita.
- b. A man and a woman fell in love in a small town in Italy.
一个男人和一个女人在意大利的小镇上相爱。
Yíge nánrén hé yíge nǚrén zài yìdàlì de xiǎo zhèn shàng xiāng ài.
男と女がイタリアの小さな街で恋に落ちました。
Otokoto-onna-ga itaria-no tiisana mati-de koi-ni otimasita.
- c. The two got married at the end of the story.
故事的结尾，那两个人结婚了。
Gùshì de jiéwěi nà liǎng gèrén jiéhūnle.
その二人は物語の最後で結婚しました。
Sono-futari-wa monogatari-no saigo-de kekkon-simasita.

Items 25–36 were used only in Experiments 1B (Chinese) and 1C (Japanese)

25. a. The waitress brought a salad to the customer.
服务员给客人端上了一盘沙拉。
Fúwùyuán gěi kèrén duān shàngle yì pán shālā.
ウェイトレスが客にサラダを持ってきました。
Ueitoresu-ga kyaku-ni sarada-o mottekimasita.
- b. Some sliced tomatoes were on top of the lettuce.
生菜上面放着切片的番茄。
Shēngcài shàngmian fàngzhe qiēpiàn de fānqié.
スライスしたトマトが何枚かレタスの上に乗っていました。
Suraису-sita tomato-ga nanmai-ka retasu-no ue-ni notteimasita.
- c. The customer chose Italian dressing for the salad.
客人选择了意大利酱来吃这盘沙拉。
Kèrén xuǎnzéle yìdàlì jiàng lái chī zhè pán shālā.
客はそのサラダのためにイタリアンドレッシングを選びました。
Kyaku-wa sono-sarada-no tame-ni itariandoressingu-o erabimasita.

26. a. The taxi driver took the football player to the hospital.
出租车司机把橄榄球运动员送到了医院。
Chūzū chē sījī bǎ gǎnlǎnqiú yùndòngyuán sòng dào le yīyuàn.
タクシーの運転手がフットボール選手を病院に連れて行きました。
Takusii-no untensyu-ga futtobooru-sensyu-o byooin-ni tureteikimasita.
- b. The injury looked very serious.
伤势好像特别严重。
Shāngshì hǎoxiàng tèbié yánzhòng.
その怪我はとても深刻なようでした。
Sono-kega-wa totemo sinkoku-na-yoodesita.
- c. An X-ray was taken immediately.
随即照了 X 光。
Suíjí zhào le X guāng.
すぐにレントゲンが撮られました。
Sugu-ni rentogen-ga toraremasita.
27. a. The secretary answered a phone call.
秘书接听了电话。
Mìshū jiētīngle diànhuà.
秘書が電話に出ました。
Hisyo-ga denwa-ni demasita.
- b. It was from a manager who was very angry.
是正在火冒三丈的科长。
Shì zhèngzài huǒmào sānzhàng de kē zhǎng.
それは激怒している課長からでした。
Sore-wa gekido-siteiru kathyoo-kara-desita.
- c. Everyone in the office became quiet and looked at the secretary.
办公室的每一个人都安静了下来，望着那个秘书。
Bàngōngshì de měi yí gè rén dōu ānjìngle xiàlai wàngzhe nàge mìshū.
オフィスのみんなが静かになり、その秘書を見つめました。
Ofisu-no minna-ga sizuka-ni-nari sono-hisyo-o mitumemasita.
28. a. The fashion designer made a nice dress.
服装设计师设计了一条可爱的裙子。
Fúzhuāng shèjì shī shèjì le yí tiáo kě ài de qúnzi.
ファッションデザイナーが可愛いドレスを作りました。
Fassyondezainaa-ga kawaii doresu-o tukurimasita.

- b. Bright yellow stripes were on the material.
布料上印有淡黄色的条纹。
Bùliào shàng yìn yǒu dàn huángsè de tiáowén.
明るい黄色のストライプが生地に入っていました。
Akarui kiiri-no sutoraipu-ga kizi-ni haitteimasita.
- c. The dress will go on sale soon.
那条裙子计划将立即上市。
Nà tiáo qún zi jìhuà jiāng lìjī shàngshì.
そのドレスはもうすぐ販売される予定です。
Sono-doresu-wa moosugu hanbaisareru yoteedesu.
29. a. The little girl was in the park riding a bicycle.
小女孩在公园里骑自行车。
Xiǎo nǚhái zài gōngyuán lǐ qí zìxíngchē.
小さな女の子が公園で自転車に乗っていました。
Tiisana onnano-ko-ga kooen-de zitensya-ni notteimasita.
- b. Suddenly, a bulldog started barking at something on the path.
突然，一只法国斗牛犬对着路边某个东西开始叫了起来。
Tūrán yì zhī fǎguó dòuniú quǎn duìzhe lù biān mǒu gè dōngxi kāishǐ jiàole qǐlai.
突然、通り道でブルドッグが何かに吠え始めました。
Totuzen toorimiti-de burudoggu-ga nanika-ni hoehazimemasita.
- c. The dog looked really scary.
那只狗看起来非常可怕。
Nà zhī gǒu kàn qǐlai fēicháng kěpà.
その犬はとても恐そうでした。
Sono-inu-wa totemo kowasoodesita.
30. a. The college student posted a message on Facebook.
大学生在 Facebook 上发了一条新鲜事。
Dàxuéshēng zài Facebook shàng fāle yìtiáo xīnxiān shì.
大学生が Facebook にメッセージを投稿しました。
Daigakusee-ga Facebook-ni messeezi-o tookoo-simasita.
- b. Some pictures of temples and elephants were also uploaded.
几张寺庙和大象的照片也一起被传了上去。
Jǐ zhāng sìmiào hé dà xiàng de zhàopiàn yě yìqǐ bèi chuánle shàngqù.
数枚のお寺やゾウの写真も一緒にアップされました。
Suumai-no otera-ya zoo-no syasin-mo issyoni appu-saremasita.

- c. The student was excited about the vacation in Thailand.
那个学生非常享受在泰国的假期。
Nàge xuésheng fēicháng xiǎngshòu zài tàiguó de jiàqī.
その学生はタイでの休暇を大いに楽しみました。
Sono-gakusee-ga tai-deno kyuuka-o ooini tanosimimasita.

31. a. Ann was going to help her brother wash the car.
周莉莉本来计划帮弟弟洗一下车。
Zhōulili běnlái jìhuà bāng dìdì xǐ yíxià chē.
理恵さんは弟の洗車を手伝う予定でした。
Rie-san-wa ootoo-no sensya-o tetudau yotee-desita.

- b. But unfortunately, it started raining very heavily.
但不巧的是，已经开始下起了大雨。
Dàn bù qiǎo de shì yǐjīng kāishǐ xià qǐle dàyǔ.
でも残念ながら大雨が降り始めました。
Demo zannen-nagara ooame-ga furihazimemasita.

- c. The plan was postponed to the next day.
那个计划只能延期到第二天来进行了。
Nàge jìhuà zhǐ néng yánqī dào dìèrtiān lái jìnxíngle.
その予定は翌日に延期になりました。
Sono-yotee-wa yokuzitu-ni enki-ni narimasita.

32. a. Kate surprised her family the other day.
前些天刘敏给了家人一个惊喜。
Qián xiē tiān liú mǐn gěile jiārén yíge jīngxǐ.
先日綾さんは家族を驚かせました。
Senzitu Aya-san-wa kazoku-o odorokasemasita.

- b. An amazing dinner was ready on the dining table.
饭桌上准备了豪华的晚餐。
Fànzuō shàng zhǔnbèile háohuá de wǎncān.
食卓の上に豪華な夕食が用意されていたのです。
Syokutaku-no ue-ni gooka-na yuusyoku-ga yooi-sareteitanodesu.

- c. Nobody expected that.
谁也没有预料到这个。
Shéi yě méiyǒu yùliào dào zhège.
誰もそれを予想していませんでした。
Dare-mo sore-o yosoo-siteimasendesita.

33. a. The artist was helping Grace draw pictures.
 一个画家正帮着张娟画画。
 Yígè huàjiā zhèng bāngzhe Zhāngjuān huàhuà.
 ある画家が舞さんの絵描きを手伝っていました。
 Aru-gaka-ga Mai-san-no ekaki-o tetudatteimasita.
- b. The last task was to draw a basket of fruit.
 最后的一项作业是画一个水果篮子。
 Zuìhòu de yí xiàng zuòyè shì huà yígè shuǐguǒ lánzi.
 最後の課題はフルーツバスケットを描くことでした。
 Saigo-no kada-wa furuutabasuketto-o kakukoto-desita.
- c. It took 5 hours to complete that picture.
 画那幅画花了 5 个小时。
 Huà nà fú huà huāle 5 gè xiǎoshí.
 その絵を完成させるのに 5 時間かかりました。
 Sono-e-o kanseesaseru-noni 5-zikan kakarimasita.
34. a. The dentist called Paul last night.
 牙医昨晚给王大明打了电话。
 Yáyī zuó wǎn gěi wángdà míng dǎle diànhuà.
 歯医者さんが昨夜健太君に電話しました。
 Haisya-san-ga sakuya Kenta-kun-ni denwa-simasita.
- b. It was to cancel the appointment of the next day.
 第二天的看牙预约被取消了。
 Dì èr tiān de kàn yá yùyuē bèi qǔxiāole.
 翌日に入っていた予約をキャンセルするためでした。
 Yokuzitu-ni haitteita yoyaku-o kyanseru-suru-tame-desita.
- c. The dentist had caught a bad cold earlier in the week.
 那个牙医本周初感冒了。
 Nàge yáyī běn zhōu chū gǎnmào le.
 その歯医者、その週の始めに風邪をこじらせていました。
 Sono-haisya-wa sono-syuu-no hazime-ni kaze-o koziraseteimasita.
35. a. The movie director was sitting in a chair at the studio.
 电影导演在摄影棚的椅子上坐着。
 Diànyǐng dǎoyǎn zài shèyǐng péng de yǐzi shàng zuòzhe.
 映画監督がスタジオで椅子に座っていました。
 Eigakantoku-ga sutazio-de isu-ni suwatteimasita.

- b. Two actors performed a fight scene.

两个演员表演了一场打斗。

Liǎng gè yǎnyuán biǎoyǎnle yì cháng dǎdòu.

2人の俳優が喧嘩のシーンを演じました。

Futari-no haiyuu-ga kenka-no siin-o enzimasita.

- c. However, the director didn't like the performance.

但是，导演并不喜欢这场表演。

Dànshì dǎoyǎn bìng bù xǐhuan zhè cháng biǎoyǎn.

残念ながら、監督はその演技に納得しませんでした。

Zannen-nagara kantoku-wa sono-engi-ni nattoku-simasendesita.

36. a. The news reporter visited a local high school to conduct an interview.

新闻记者走进了本地的高中进行采访。

Xīnwén jìzhě zǒu jìnle běndì de gāozhōng jìnxíng cǎifǎng.

ニュースリポーターがインタビューのため、近くの高校を訪問しました。

Nyuusuripootaa-ga intabyuu-no-tame tikaku-no kookoo-o hoomonsimasita.

- b. A student there would be competing in the Olympics.

有一个学生将会参加奥林匹克运动会。

Yǒu yí gè xuésheng jiāng huì cānjiā Àolínpǐkè yùndòng huì.

その生徒がオリンピックに出場する予定でした。

Soko-no seito-ga orinpikku-ni syutuzuyoo-suru yotee-desita.

- c. The interview lasted for 30 minutes.

那次采访持续了 30 分钟。

Nà cì cǎifǎng chíxùle 30 fēnzhōng.

そのインタビューは 30 分続きました。

Sono-intabyuu-wa 30-pun tuzukimasita.

APPENDIX B: C-test used for native-English and L2-English participants (Schultz, 2006)

Fill-in-the-blank task: Please fill in the blanks in the passages below.

Text 1:

We all live with other people's expectations of us. These are a refle_____ of th_____ trying to under_____ us; th_____ are predic_____ of wh_____ they th_____ we will think, d_____ and feel. Gene_____ we acc_____ the sta_____ quo, but these expect_____ can be ha_____ to han_____ when they co_____ from our fami_____ and can be diff_____ to ign_____, especially wh_____ they come from our par_____.

Text 2

The decision to remove soft drinks from elementary and junior high school vending machines is a step in the right direction to helping children make better choices when it comes to what they eat and drink. Childhood obe_____ has bec_____ a ser_____ problem in th_____ country a_____ children cons_____ more sugar-based fo_____ and sp_____ less ti_____ getting the nece_____ exercise. Many par_____ have quest_____ schools' deci_____ to al_____ vending machines which disp_____ candy and so_____ drinks. Many schools, tho_____, have co_____ to re_____ on the mo_____ these machines generate through agreements with the companies which makes soft drinks and junk food.

Text 3

Don't get me wrong. I love magazines. I've been addicted to them since my teenage years. There's some_____ about wom_____ magazine superfi_____ that I of_____ enjoy. But oh b_____, they are ju_____ so, so frustr_____ predictable. I rec_____ you co_____ throw o_____ together very eas_____ in five min_____. Take the co_____ for example: the cover im_____: get a he_____ and shou_____ shot of a smi_____, heavily make-uped and airbr_____ model (or optio_____ a fam_____ person).

APPENDIX C: Q-Q plots for Experiments 1 and 3

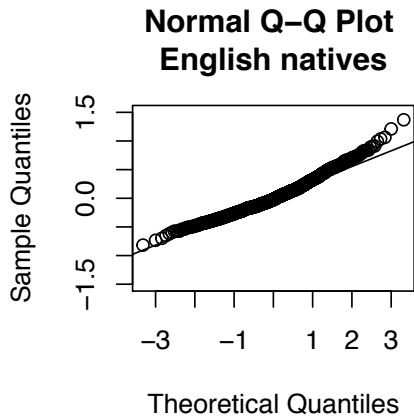


Figure C.1. Native English speakers

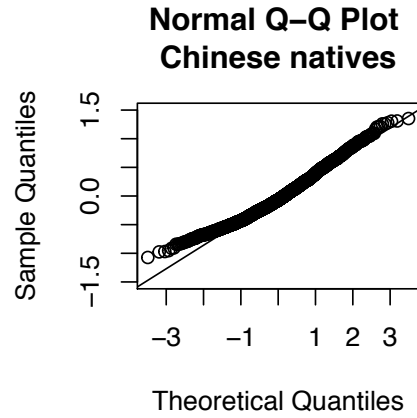


Figure C.2. Native Chinese speakers

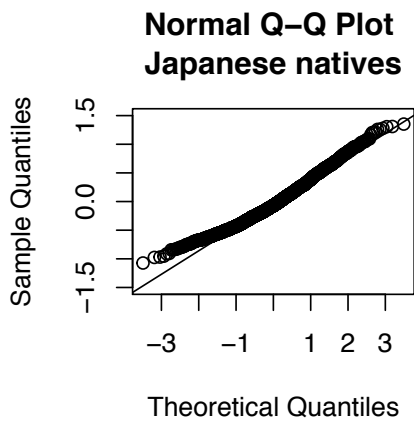


Figure C.3. Native Japanese speakers

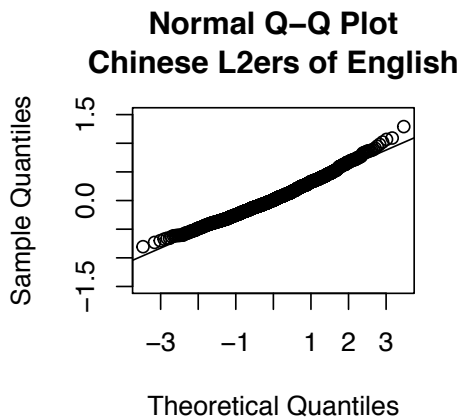


Figure C.4. L1-Chinese L2ers of English

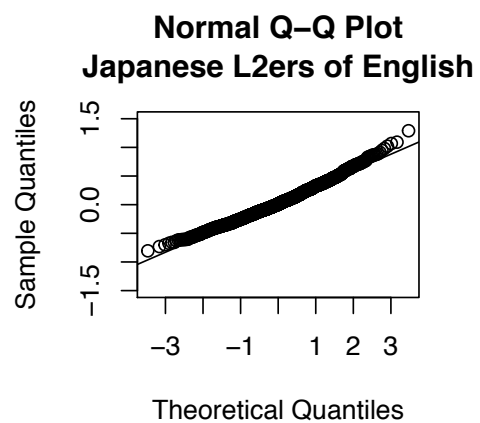


Figure C.5. L1-Japanese L2ers of English

APPENDIX D: Plots for checking homoscedasticity

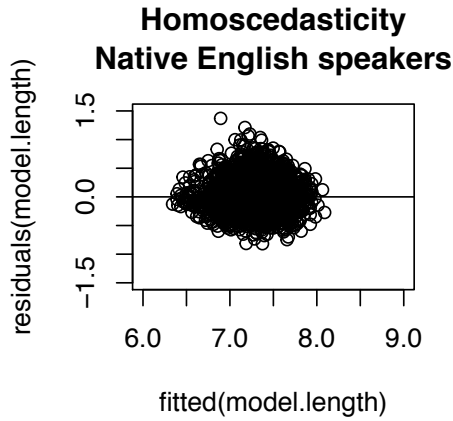


Figure D.1. Native English speakers

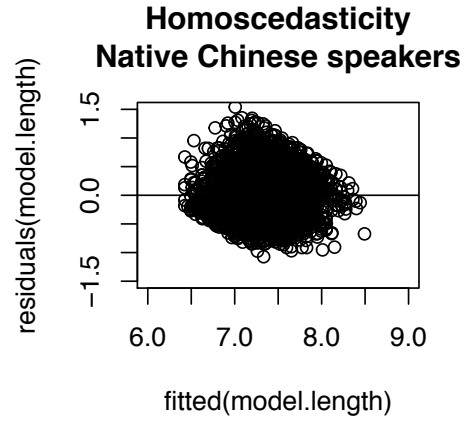


Figure D.2. Native Chinese speakers

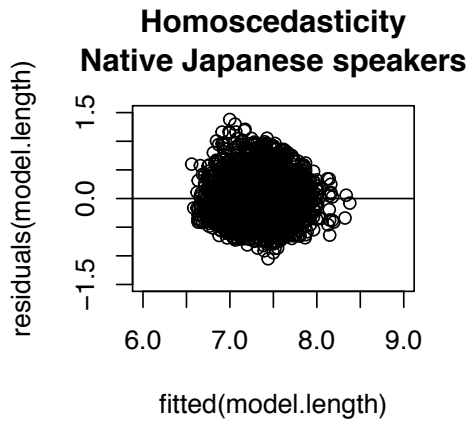


Figure D.3. Native Japanese speakers

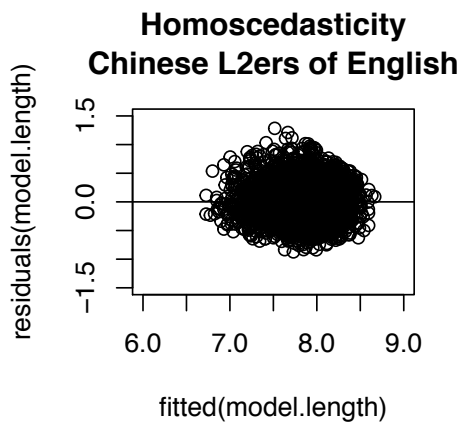


Figure D.4. L1-Chinese L2ers of English

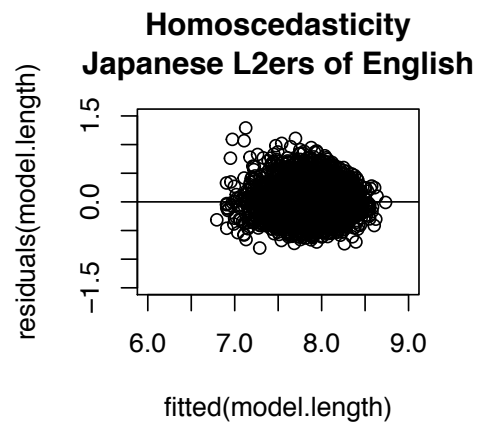


Figure D.5. L1-Japanese L2ers of English

APPENDIX E: Fill-in-the-blank task for native Chinese participants

填空题

请阅读以下段落，在每个括号中填入一个适当的词语。

1. 从6月1日()，被称为“史上最严禁烟令”()《北京市控制吸烟条例》正式实施。()，根据该条例，在公共场所、()、工作场所的室内区域()公共交通工具()，全面禁止吸烟。在禁止吸烟场所违规吸烟的个人，最高将()罚款200元。
2. 4月7日下午，刘翔在自己的微博中正式宣布结束自己的()生涯。“从()起，我将结束()职业运动生涯，正式退役。”刘翔在12()的职业生涯里参加了48次国际大()，一共取得36金6银3铜的傲人()。
3. 对于韩国中东呼吸综合症疫情继续扩散，香港特区政府()局近日对韩国发出红()外游警示。因应()情况，香港旅游业议会与()社开会后，决定取消即日()6月底所有前往()的旅行团。()预料牵涉500至600团，1万多名旅客。
4. 在()上“我们的哆啦A梦回来()!”，“你是永远的朋友”等帖子不断涌现。28日起在北京等()各地上映的日本3D()电影《哆啦A梦：伴我同行》，已经成为了最近最为热门的()话题之一。根据最新统计()，本作品上映3天的累计票房已经突破1.45亿()。
5. 4月25日，日本选手福原爱进行了到达苏州的首次()，()称为“瓷娃娃”的她在训练中吸引了大批记者()。“瓷娃娃”的笑容()是福原爱的标志，一直被中国球迷所喜()。福原爱刚抵达苏()，就收到了粉丝送上的99朵玫瑰。
6. 春秋()宣布，6月30日将正式开通上海至日本名古屋()。此外，6月29日将开通合肥、哈尔滨()名古屋航线，6月30日开通呼和浩特-石家庄-名古屋航线。到今年3月()，春秋航空()开辟15()中日航线，每周提供64个航班。至2014年底，春秋航空中日所有航线累计运输旅客突破80()次。

[Listening transcripts in BitEX 中国語, retrieved from <https://bitex-cn.com/>]

APPENDIX F: Fill-in-the-blank task for native Japanese participants

穴埋め問題

下の各文章を読み、（ ）に適切な言葉を入れてください。

[文章 1]

正月には前年お（ ）になった人や知人などに年賀状を送る（ ）があり、（ ）付き年賀はがきの抽選（ ）までを正月とする習慣も多い。元来は年の初めに「お年始」として家に（ ）に行ったり人が訪ねて（ ）するはずのものが簡素（ ）されたものとも言える。1990 年代末頃から（ ）電話が普及したこと（ ）あり、年賀状でなく（ ）などで済ま（ ）ことが多くなってきている。（ ）、新年最初に会った人とは、「あけましておめでとう（ ））」という挨拶が（ ）される場合が多い。これは、英語（ ）の「ハッピー・ニューイヤー（Happy New Year）」が主に年末（ ）言われるのとは（ ）、新年になってから（ ）なければ言われない。年末に、来年になるまで会わないであろう人とは、「よい（ ））」という（ ）がよく交わされる。

[文章 2]

グローバル化（ ）進むなかで、先進国から（ ）国への留学もみられるようになり、今日の留学（ ）相互交通的、多元的な時代に（ ）っている。文化や制度や（ ）・常識は国によって大きく（ ）ことから、（ ）する際には事前調査（ ）計画をしっかりと立て、（ ）などにも備えておく（ ）があるとされる（ ）、また、逆にそうしたことから（ ）の文化や制度を見つめ（ ）ことができるのも留学の（ ）点とされ、近代化の枠組みを超えた、（ ）の習得や様々（ ）人脈の形成、自己啓発、自己鍛錬などを動議（ ）留学が増えている。語学留学の場合、アメリカ、イギリスを（ ）にした英語留学（その他の国にカナダ、アイルランド、ニュージーランド、オーストラリア、フィジーなど）や、フランスでのフランス語習得、中国、台湾での中国語習得などを（ ）としたものが一般的（ ）になっている。

[Articles on 正月 and 留学 in Wikipedia, retrieved from <https://ja.wikipedia.org>]

APPENDIX G: Items for the picture-narration task (Experiments 2 & 4)

The description sentence for Picture 1 and the fragment for Picture 3 in each item are given below. The Chinese sentences are from the old stimuli; the new stimuli have their subject NP at the beginning of the sentences, before the temporal adverbials.

1. Yesterday, Daisy had a birthday party (with Mickey/Minnie).

昨天，黛丝鸭（和米奇/米妮）举办了一个生日聚会。

Zuótiān Dàisīyā (hé Mǐqí/Mǐnī) jǔbànle yí gè shēngrì jùhuì.

昨日、デイジーは（ミッキー／ミニーと）誕生日会を開きました。

Kinoo Deizii-wa (Mikkii/Minii-to) tanzyoobikai-o hirakimasita.

Some big strawberries were...

大大的草莓...

dàdà de cǎoméi...

大きないちごが...

Ookina itigo-ga...

2. Today, Daisy was in a science lab (with Mickey/Minnie).

今天，黛丝鸭和米妮一起在理科实验室里。

Jīntiān Dàisīyā (hé Mǐqí/Mǐnī) yìqǐ zài lǐkē shíyàn shì lǐ.

今日、デイジーは（ミッキー／ミニーと）理科の実験室にいました。

Kyoo Deizii-wa (Mikkii/Minii-to) rika-no zikkensitu-ni imasita.

The result was...

結果...

Jiēguǒ...

結果は...

Kekka-wa...

3. Last night, Daisy read a sad story (with Mickey/Minnie).

昨晚，黛丝鸭（和米奇/米妮）读了一个悲剧故事。

Zuó wǎn Dàisīyā (hé Mǐqí/Mǐnī) dúle yí gè bēijù gùshì.

昨夜、デイジーは（ミッキー／ミニーと）悲しい物語を読みました。

Sakuya Deizii-wa (Mikkii/Minii-to) kanasii monogatari-o yomimasita.

The title of the book was...

那本书的题目是...

nàběnshū de tí mù shì...

その本のタイトルは...

Sono-hon-no taitoru-wa...

4. A few minites ago, Daisy was on the stage (with Mickey/Minnie).

几分钟前，黛丝鸭（和米奇/米妮）在舞台上。

Jǐ fēnzhōng qián Dàisīyā (hé Mǐqí/Mǐnī) zài wǔtái shàng.

数分前、デイジーは（ミッキー／ミニーと）ステージの上にいました。

Suufunmae Deizii-wa (Mikkii/Minii-to) suteezi-no ue-ni imasita.

Later, the red curtains were...

之后，红色的幕布...

zhīhòu, hóngsè de mùbù...

その後、赤いカーテンが...

Sonogo, akai kaaten-ga...

5. Yesterday, Daisy practiced hula (with Mickey/Minnie).

昨天，黛丝鸭（和米奇/米妮）练习了草裙舞。

Zuótiān Dàisīyā (hé Mǐqí/Mǐnī) liànxíle cǎo qún wǔ.

昨日、デイジーは（ミッキー／ミニーと）フラの練習をしました。

Kinoo Deizii-wa (Mikkii/Minii-to) fura-no rensyuu-o simasita.

A little crab was...

一只小螃蟹...

yì zhī xiǎo pángxiè...

一匹の小さなカニが...

Ippiki-no tiisana kani-ga...

6. Last month, Donald took a boat ride (with Mickey/Minnie).

上个月，唐老鸭（和米妮/米奇）坐了船。

Shàng gè yuè Tánglǎoyā (hé Mǐnī/Mǐqí) zuòle chuán.

先月、デイジーは（ミッキー／ミニーと）ボートに乗りました。

Sengetu Deizii-wa (Mikkii/Minii-to) booto-ni norimasita.

Two dolphins came...

两只海豚...

liǎngzhī hǎitún...

二匹のイルカが...

Nihiki-no iruka-ga...

7. This afternoon, Donald fell asleep at the pool (with Mickey/Minnie).

今天下午，唐老鸭（和米妮/米奇）在泳池边睡觉。

Jīntiān xiàwǔ Tánglǎoyā (hé Mǐnī/Mǐqí) zài yǒngchí biān shuìjiào.

今日の午後、ドナルドは（ミッキー／ミニーと）プールサイドで寝ました。

Kyoo-no gogo Donarudo-wa (Mikkii/Minii-to) puurusaido-de nemasita.

The sunglasses were made...

那个墨镜产自...

Nàge mòjìng chǎn zì...

そのサングラスは...

Sono-sangurasu-wa...

8. Last month, Donald went camping (with Mickey/Minnie).

上个月，唐老鸭（和米妮/米奇）去了露营。

Shàng gè yuè Tánglǎoyā (hé Mǐnī/Mǐqí) qùle lùyíng.

先月、ドナルドは（ミッキー／ミニーと）キャンプに行きました。

Sengetu Donarudo-wa (Mikkii/Minii-to) kyanpu-ni ikimasita.

Later, some shrimp were also...

之后，几只虾也被...

Zhīhòu, jǐ zhī xiā yě bèi...

その後、数匹のエビも...

Sonogo, suuhiki-no ebi-mo...

9. Two days ago, Donald went to a flower shop (with Mickey/Minnie).

两天前，唐老鸭（和米妮/米奇）去了花店。

Liǎng tiān qián Tánglǎoyā (hé Mǐnī/Mǐqí) qùle huā diàn.

おとつい、ドナルドは（ミッキー／ミニーと）お花屋さんに行きました。

Ototui Donarudo-wa (Mikkii/Minii-to) ohanaya-san-ni ikimasita.

A honey bee...

一只蜜蜂...

Yīzhī mìfēng...

一匹のミツバチが...

Ippiki-no mitubati-ga...

10. A few minutes ago, Donald left the house (with Mickey/Minnie).

几分钟前，唐老鸭（和米妮/米奇）离开了家。

Jǐ fēnzhōng qián Tánglǎoyā (hé Mǐqí/Mǐnī) líkāile jiā.

数分前、ドナルドは（ミッキー／ミニーと）家を出ました。

Suufunmae Donarudo-wa (Mikkii/Minnii-to) ie-o demasita.

It was...

时间是...

Shíjiān shì...

時間は...

Zikan-wa...

11. Last Sunday, Mickey went to church (with Donald/Daisy).

上星期天，米奇（和黛丝鸭/唐老鸭）去了教会。

Shàng zhōu xīngqītiān Mǐqí (hé Dàisīyā/Tánglǎoyā) qùle jiāohuì.

先週の日曜日、ミッキーは（ドナルド／デイジーと）教会に行きました。

Sensyuu-no nitiyoobi Mikkii-wa (Donarudo/Deizii-to) kyookai-ni ikimasita.

The microphone was...

那个麦克风...

Nàge màikèfēng...

そのマイクは...

Sono-maiku-wa...

12. Yesterday, Mickey went to a restaurant (with Donald/Daisy).

昨天，米奇（和黛丝鸭/唐老鸭）去了餐厅。

Zuótiān Mǐqí (hé Dàisīyā/Tánglǎoyā) qùle cāntīng.

昨日、ミッキーは（ドナルド／デイジーと）レストランに行きました。

Kinoo Mikkii-wa (Donarudo/Deizii-to) resutoran-ni ikimasita.

The meal was...

那顿饭...

Nà dùn cān...

その料理は...

Sono-ryoori-wa...

13. A few hours ago, Mickey went to a bakery (with Donald/Daisy).

几个小时之前，米奇（和黛丝鸭/唐老鸭）去面包店了。

Jǐ gè xiǎoshí qián Mǐqí (hé Dàisīyā/Tánglǎoyā) qù miànbāo diànle.

数分前、ミッキーは（ドナルド／デイジーと）パン屋さんに行きました。

Suufunmae Mikkii-wa (Donarudo/Deizii-to) panya-san-ni ikimasita.

Many chocolate chips were...

很多巧克力片...

Hěnduō qiǎokèlì piàn...

たくさんのチョコレートチップが...

Takusan-no tyokoree-to tippu-ga...

14. Last week, Mickey went to a soccer field (with Donald/Daisy).

上周，米奇（和黛丝鸭/唐老鸭）去足球场了。

Shàng zhōu Mǐqí (hé Dàisīyā/Tánglǎoyā) qù zúqiú chǎngle.

先週、ミッキーは（ドナルド／デイジーと）サッカー場に行きました。

Senyuu Mikkii-wa (Donarudo/Deizii-to) sakkaazyoo-ni ikimasita.

The fans in the stand were...
看台上的粉丝们...
Kàntái shàng de fēnsīmen...
スタンドにいた観客は...
Sutando-ni ita kankyaku-wa...

15. A little while ago, Mickey had dinner (with Donald/Daisy).

刚才，米奇（和黛丝鸭/唐老鸭）吃了晚饭。
Gāngcái Mǐqí (hé Dàisīyā/Tánglǎoyā) chīle wǎnfàn.
さっき、ミッキーは（ドナルド／デイジーと）晩御飯を食べました。
Sakki Mikkii-wa (Donarudo/Deizii-to) bangohan-o tabemasita.

A star was...
一颗星星...
Yīkē xīngxīng...
星が1つ...
Hosi-ga hitotu...

16. Last weekend, Minnie went hiking (with Donald/Daisy).

上周末，米妮（和唐老鸭/黛丝鸭）去爬山了。
Shàng zhōumò Mǐnī (hé Tánglǎoyā/Dàisīyā) qù páshānle.
先週末、ミニーは（ドナルド／デイジーと）ハイキングに行きました。
Sensyuumatu Minii-wa (Donarudo/Deizii-to) haikingu-ni ikimasita.

A butterfly was...
一只蝴蝶...
Yīzhī húdié...
一匹のチョウチョが...
Ippiki-no tyootyo-ga...

17. Last Saturday, Minnie went snorkeling (with Donald/Daisy).

上星期六，米妮（和唐老鸭/黛丝鸭）一起去潜水了。
Shàng zhōu xīngqīliù Mǐnī (hé Tánglǎoyā/Dàisīyā) yìqǐ qù qiánshuǐle.
先週の土曜日、ミニーは（ドナルド／デイジーと）シュノーケルに行きました。
Sensyuu-no doyoobi Minii-wa (Donarudo/Deizii-to) syunookeru-ni ikimashita.

A sea turtle was...
一只海龟...
Yīzhī hǎiguī...
ウミガメが一匹...
Umigame-ga ippiki...

18. Yesterday, Minnie went to the movies (with Donald/Daisy).

昨天，米妮（和唐老鸭/黛丝鸭）去看电影了。

Zuótiān Mǐnī (hé Tánglǎoyā/Dàisīyā) qù kàn diànyǐng.

昨日、ミニーは（ドナルド／デイジーと）映画を見に行きました。

Kinoo Minii-wa (Donarudo/Deizii-to) eega-o miniikimasita.

The theater was...

那个电影院...

Nàge diànyǐngyuàn...

その映画館は...

Sono-eegakan-wa...

19. A few minutes ago, Minnie started cooking (with Donald/Daisy).

几分钟前，米妮（和唐老鸭/黛丝鸭）开始做饭。

Jǐ fēnzhōng qián Mǐnī (hé Tánglǎoyā/Dàisīyā) kāishǐ zuò fàn.

数分前、ミニーは（ドナルド／デイジーと）料理をし始めました。

Suufunmae Minii-wa (Donarudo/Deizii-to) ryoori-o si hazimemasita.

Luckily, a mop and a bucket were...

幸运的是，拖把和桶...

Xīngyùn de shì, tuōbǎ hé tǒng...

運良く、モップとバケツが...

Unyoku, moppu-to baketu-ga...

20. A little while ago, Minnie watched a comedy (with Donald/Daisy).

就在刚刚，米妮（和唐老鸭/黛丝鸭）看搞笑节目了。

Jiù zài gānggang Mǐnī (hé Tánglǎoyā/Dàisīyā) kàn gǎoxiào jiémù.

ついさっき、ミニーは（ドナルド／デイジーと）お笑い番組を見ました。

Tuisakki Minii-wa (Donarudo/Deizii-to) owaraibangumi-o mimasita.

The comedian had...

那个喜剧演员有...

Nàge xǐjù yǎnyuán yǒu...

そのコメディアンは...

Sono-komedian-wa...

21. Last week, Daisy got on the train (with Mickey/Minnie).

上周，黛丝鸭（和米奇/米妮）坐上了电车。

Shàng zhōu Dàisīyā (hé Mǐqí/Mǐnī) zuò shàngle diànchē.

先週、デイジーは（ミッキー／ミニーと）電車に乘りました。

Sensyuu Deizii-wa (Mikkii/Minii-to) densya-ni norimasita.

The train was...
那个电车...
Nàge diànchē...
その電車は...
Sono-densya-wa...

22. This morning, Donald rode the elevator (with Mickey/Minnie).
今天早上，唐老鸭（和米妮/米奇）坐上了直升电梯。
Jīntiān zǎoshang Tánglǎoyā (hé Mǐnī/Mǐqí) zuò shàngle zhí shēng diàntī.
今朝、ドナルドは（ミッキー／ミニーと）エレベーターに乗りました。
Kesa Donarudo-wa (Mikkii/Minii-to) erebeetaa-ni norimasita.

Suddenly, the alarm started...
突然，警铃...
Tūrán, jǐnglíng...
突然アラームが...
Totuzen araamu-ga...

23. Last Friday, Mickey went to the tennis court (with Donald/Daisy).
上周五，米奇（和黛丝鸭/唐老鸭）去了网球场。
Shàng zhōu xīngqīwǔ Mǐqí (hé Dàisīyā/Tánglǎoyā) qùle wǎng qiúchǎng.
先週の金曜日、ミッキーは（ドナルド／デイジーと）テニスコートに行きました。
Sensyuu-no kinyoobi Mikkii-wa (Donarudo/Deizii-to) tenisukooto-ni ikimasita.

But then it started...
但不久就开始...
Dàn bùjiǔ jiù kāishǐ...
でも、そのうち雨が...
Demo sonouti ame-ga...

24. Yesterday, Minnie went to the garden (with Donald/Daisy).
昨天，米妮（和唐老鸭/黛丝鸭）去了花园。
Zuótiān Mǐnī (hé Tánglǎoyā/Dàisīyā) qùle huāyuán.
昨日、ミニーは（ドナルド／デイジーと）庭に行きました。
Kinoo Minii-wa (Donarudo/Deizii-to) niwa-ni ikimashita.

Some bluebirds were...
几只蓝色的小鸟...
Jǐ zhī lán sè de xiǎo niǎo...
青い鳥が数匹...
Aoi tori-ga suuhiki...

25. Two days ago, Daisy went to the library (with Mickey/Minnie).

两天前，黛丝鸭（和米奇/米妮）去了图书馆。

Liǎng tiān qián Dàisīyā (hé Mǐqí/Mǐnī) qùle túshū guǎn.

おとつい、デイジーは（ミッキー／ミニーと）図書館に行きました。

Ototui Deizii-wa (Mikkii/Minii-to) tosyokan-ni ikimasita.

The building closed...

关门时间是...

Guānmén shíjiān shì...

閉館時間は...

Heikan zikan-wa...

26. Last night, Minnie watched TV (with Donald/Daisy).

昨天晚上，米妮（和唐老鸭/黛丝鸭）看了电视。

Zuótīan wǎnshang Mǐnī (hé Tánglǎoyā/Dàisīyā) kànle diànshì.

昨夜、ミニーは（ドナルド／デイジーと）テレビを見ました。

Sakuya Minii-wa (Donarudo/Deizii-to) terebi-o mimasita.

It was already...

时间已经是...

Shíjiān yǐjīng shì...

時間はもう...

Zikan-wa moo...

27. Yesterday afternoon, Donald studied (with Mickey/Minnie).

昨天下午，唐老鸭（和米妮/米奇）学习了。

Zuótīan xiàwǔ Tánglǎoyā (hé Mǐnī/Mǐqí) xuéxíle.

昨日の午後、ドナルドは（ミッキー／ミニーと）勉強しました。

Kinoo-no gogo Donarudo-wa (Mikkii/Minii-to) benkyoo-simasita.

The title of the song was...

那首歌的名字...

Nà shǒu gē de míngzi...

その歌のタイトルは...

Sono-uta-no taitoru-wa...

28. Last night, Mickey was outside (with Donald/Daisy).

昨天晚上，米奇（和黛丝鸭/唐老鸭）在外面。

Zuótīan wǎnshang Mǐqí (hé Dàisīyā/Tánglǎoyā) zài wàimiàn.

昨夜、ミッキーは（ドナルド／デイジーと）外にいました。

Sakuya Mikkii-wa (Donarudo/Deizii-to) soto-ni imasita.

An alien was...

一个外星人...

Yígè wài xīng rén...

一匹のエイリアンが...

Ippiki-no eirian-ga...

29. Last weekend, Minnie went driving (with Donald/Daisy).

上周末，米妮（和唐老鸭/黛丝鸭）开车兜风。

Shàng zhōumò Mǐnī (hé Tánglǎoyā/Dàisīyā) kāichē dōufēng.

先週末、ミニーは（ドナルド／デイジーと）ドライブに行きました。

Sensyuumatu Minii-wa (Donarudo/Deizii-to) doraibu-ni ikimasita.

The traffic light was...

红绿灯是...

Hóng lǜ xìnghàodēng shì...

信号は...

Singoo-wa...

30. Last Wednesday, Minnie played volleyball (with Donald/Daisy).

上星期三，米妮（和唐老鸭/黛丝鸭）玩了排球。

Shàng zhōu xīngqīsān Mǐnī (hé Tánglǎoyā/Dàisīyā) wánle páiqiú.

先週の水曜日、ミニーは（ドナルド／デイジーと）バレーボールをしました。

Sensyuu-no suiyoobi Minii-wa (Donarudo/Deizii-to) bareebooru-o simasita.

The label said...

那个标签...

Nàge biāoqiān...

そのラベルには...

Sono-raberu-niwa...

31. Last Tuesday, Daisy played tennis (with Mickey/Minnie).

上星期二，黛丝鸭（和米奇/米妮）打了网球。

Shàng zhōu xīngqīèr Dàisīyā (hé Mǐqí/Mǐnī) dǎle wǎngqiú.

先週の火曜日、デイジーは（ミッキー／ミニーと）テニスをしました。

Sensyuu-no kayoobi Deizii-wa (Mikkii/Minii-to) tenisu-o simasita.

A cooler was...

保冷箱...

Bǎolěng xiāng...

クーラーボックスが...

Kuuraabokkusu-ga...

32. This morning, Donald went running (with Mickey/Minnie).

今天早上，唐老鸭（和米妮/米奇）去跑步了。

Jīntiān zǎoshang Tánglǎoyā (hé Mǐnī/Mǐqí) qù pǎobùle.

今朝、ドナルドは（ミッキー／ミニーと）ランニングに行きました。

Kesa Donarudo-wa (Mikkii/Minii-to) ranningu-ni ikimasita.

An airplane was...

一架飞机...

Yíjià fēijī...

飛行機が一つ...

Hikooki-ga hitotu...

33. Last week, Daisy was by the pool (with Mickey/Minnie).

上周，黛丝鸭（和米奇/米妮）在游泳池旁边。

Shàng zhōu Dàisīyā (hé Mǐqí/Mǐnī) zài yóuyǒngchí pángbiān.

先週、デイジーは（ミッキー／ミニーと）プールサイドにいました。

Sensyuu Deizii-wa (Mikkii/Minii-to) puurusaido-ni imasita.

The title of the song was...

那首歌的名字...

Nà shǒu gē de míngzì...

その歌のタイトルは...

Sono-uta-no taitoru-wa...

34. A few minites ago, Donald ate bananas (with Mickey/Minnie).

几分钟前，唐老鸭（和米妮/米奇）吃了香蕉。

Jǐ fēnzhōng qián Tánglǎoyā (hé Mǐnī/Mǐqí) chīle xiāngjiāo.

数分前、ドナルドは（ミッキー／ミニーと）バナナを食べました。

Suufunmae Donarudo-wa (Mikkii/Minii-to) banana-o tabemasita.

The bottle said...

那个瓶子...

Nàge píngzi...

そのボトルには...

Sono-botoru-niwa...

35. Two days ago, Mickey went to a night club (with Donald/Daisy).

两天前，米奇（和黛丝鸭/唐老鸭）去了夜总会。

Liǎng tiān qián Mǐqí (hé Dàisīyā/Tánglǎoyā) qùle yèzǒnghuì.

おとつい、ミッキーは（ドナルド／デイジーと）ナイトクラブに行きました。

Ototui Mikkii-wa (Donarudo/Deizii-to) naitokurabu-ni ikimasita.

The colors of the lights were...

那个灯的颜色是...

Nàge dēng de yánsè shì...

そのライトの色は...

Sono-raito-no iro-wa...

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